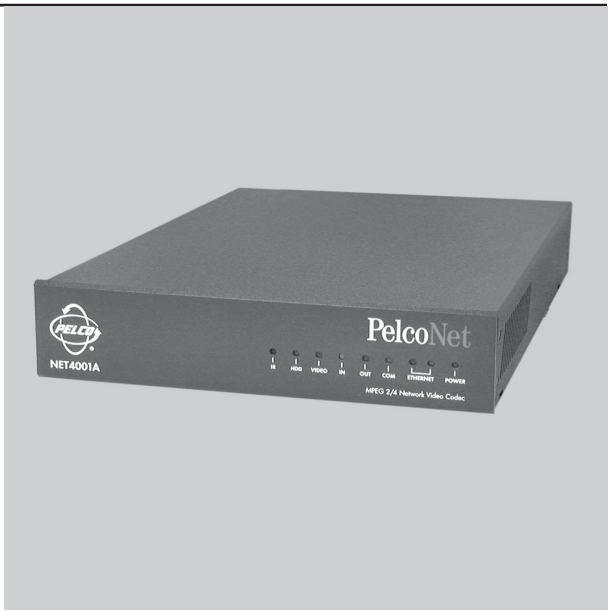
INSTALLATION/OPERATION

PelcoNet™ Multimedia Transmission Via Networks



NET4001A

C2904M-B (2/05)

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IMPORTANT SAFEGUARDS AND WARNINGS

Observe the following WARNINGS before installing and using this product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult your electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at the plug, convenience receptacle, and the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, the apparatus does not operate normally, or the apparatus has been dropped.
14. Apparatus shall not be exposed to dripping or splashing, and no objects filled with liquids, such as vases, shall be placed on the apparatus.
15. **Warning**: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
16. To reduce the risk of shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
17. Installation should be done only by qualified personnel and conform to all local codes.
18. If the unit requires 120/230 VAC and does not have an on/off switch, the input power circuit must have a circuit breaker.
19. The installation method and materials should be capable of supporting four times the weight of the unit.

The product and/or manual may bear the following marks:

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

CAUTION:
RISK OF ELECTRIC SHOCK. DO NOT OPEN.

Thoroughly familiarize yourself with the information in this manual prior to installation and operation.

REGULATORY NOTICES

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

UNPACKING INSTRUCTIONS

Unpack and inspect all parts carefully. Save the shipping carton, boxes, and inserts. They are the safest manner in which to make future shipments.

If an item needs to be returned to the factory for repair, consult the Warranty and Return Information section of this manual for instructions.

WHAT IS THE PELCONET NET4001A TRANSMISSION SYSTEM?

The PelcoNet NET4001A transmission system is technology that lets you view video in **real time** across a LAN (local area network) and even WANs (wide area networks). This technology is based on the TCP/IP protocol suite and Ethernet technology, providing compatibility with today's networking standards.

The following devices can be controlled from your computer through Internet Explorer with the PelcoNet NET4001 Transmission System: Spectra®, Esprit®, Genex® multiplexer, CM9760 (requires CM9760 data translator), CM9740 (requires CM9760 data translator), CM9502 (through integrated ASCII port), CM8500 (requires latest CM8500 data translator), CM6700 (through integrated ASCII port, COM 2), and the CM6800 matrix.

(See the *Glossary* section for definitions of terms used in this manual.)

HOW DO LANS AND WANS WORK?

- A LAN consists of multiple computers connected together, sharing information. This information could be files, e-mail, printers, or—with the PelcoNet NET4001A transmission system—even live video and audio.

- A WAN consists of multiple LANs connected over a great distance (for example, the Internet).

- In any network environment, each computer needs an address so other computers on the network know how to reach it.

  It is similar to a city with street addresses. For the post office to deliver mail to your house, you need a unique street address for the mail carrier to find you. A network is like a city. Like a street address, the IP address on your computer is your address on the network. The IP address is how other computers can find you on the network.

  Remember that the **IP address must be unique on the network.**

- When there are multiple networks and you are using the TCP/IP protocol, there must be a way to communicate between the two networks. A physical device called a router is required. The router's IP address is referred to as the default gateway IP address.

- A cable that connects one computer to another is like a city street you can use to get from one house to another. The cable lets you communicate with each other on the network. This cable is Category 5 cable with RJ-45 connectors at each end. (It looks like a phone cord, only slightly larger.)

WHO SHOULD INSTALL THE PELCONET NET4001A TRANSMISSION SYSTEM?

NOTE: Unless you are very familiar with how computers work, consult your network administrator for help.

Installation is a matter of configuring an IP address using a standard terminal program or any Internet browser and connecting the PelcoNet NET4001A transmission system to the Ethernet network. You should have the following background and experience to configure and install these units:

- Working knowledge of basic network management concepts and terminology
- Working knowledge of tools and procedures for installing and operating sensitive electronic equipment

INSTRUCTIONS FOR THE NETWORK ADMINISTRATOR

The PelcoNet™ NET4001A multimedia transmission system allows live video transmission to be viewed over TCP/IP-based networks. This section is intended to help the network administrator know what is involved with installing this product and how it will affect the network. The person installing the product will need the following information about the network to make the product function properly.

THE TRANSMITTER-RECEIVER

- A valid IP address* for each PelcoNet NET4001A transmission system unit
- Subnet mask*
- Default gateway (if applicable)
- E-mail server's IP address (if applicable)
- Dedicated maximum allowable amount of bandwidth for live video**

*Required for the PelcoNet NET4001A transmission system to function properly.

**The PelcoNet NET4001A Transmission System requires a continuous amount of bandwidth to display true live video. Pelco recommends using switches with the product so the amount of bandwidth available to each unit is constant and reliable.

THE BROWSER

If you plan to use a web browser to view live video across the network, there are procedures to complete before you can use the browser. If you installed Internet Explorer® 6.0 from the CD that came with the PelcoNet NET4001A transmission system, you can skip the following. Otherwise, complete the following before trying to use the browser.

1. Internet Explorer 5.5 or higher must be installed before continuing.
2. Set the computer's display settings to use 16- or 32-bit color. (This is required for the live video feature to function properly.)
3. Click the **Start** menu in Windows®.
4. Click **Run.**
5. In the Open box, type **D:\ACTIVEX\SETUP.EXE** (where D:\ = your CD ROM drive letter).
6. Click **OK.**
7. Follow the on-screen setup instructions to finish installing the plug-in.

MINIMUM REQUIREMENTS

- PC (Pentium® 4 microprocessor, 1.6 GHz) with Windows 98/2000/XP or higher
- Gateway to the network
- Microsoft® Internet Explorer 5.5 (or higher) or free serial interface and terminal program or PelcoNet NET4001A (acting as receiver) and video monitor
- Screen resolution of 800 x 600 pixels or higher, 16- or 32-bit pixel color resolution

MPEG ACTIVEX® PLATFORM REQUIREMENTS

RAM:	256 Mbyte
Graphic Card:	ATI RADEON™ 7500 or 8500, Matrox G 550 or Parhelia™, or NVIDIA® GeForce 3 or 4 with direct show compatible MPEG-2 playback capability (DVD player)
Ethernet Card:	100 Mbit
ISDN Card:	Not required
Sound Card:	Recommended
Software:	DirectX® 8.1 or 9.0 application programming interface

OVERVIEW

NOTE: This manual refers to the PelcoNet NET4001A transmission system when discussing features, functions, or specifications that apply to the transmitter/receiver. "Receiver," as used in this manual, refers to the PelcoNet NET4001A unless otherwise noted.

DESCRIPTION

The PelcoNet NET4001A Transmission System is a network video server whose primary purpose is to encode and decode live video, audio, and control data for transmission over existing Ethernet computer networks (either intranet or Internet) using the TCP/IP protocol. You can view the pictures on a CCTV or PC monitor.

The NET4001A functions as a transmitter/receiver and is the only unit required to use the PelcoNet NET4001A transmission system. The NET4001A connects any NTSC or PAL video sources (cameras, for example) to the computer network.

Depending on how you want to display the video, you can use a NET4001A as a transmitter with a PC or a NET4001A as a receiver. There are two ways to display remote video:

- Web browser using any PC on the network to display the video
- A NET4001A (as a receiver) with attached standard NTSC or PAL monitor

Two NET4001A units (as transmitter and receiver) can form a standalone system for data transfer without a PC.

Transmitters and receivers are identified by IP addresses, just like any other equipment connected to a computer network.

There is a bi-directional serial interface for remote control of peripherals like PTZ cameras. This interface can also transmit transparent data. The NET4001A transmits full-duplex audio.

In appropriately configured networks, the multicast function permits simultaneous video transmission in real time to several receivers. For this to work, the UDP and IGMP multicasting protocols must be implemented in the network.

The NET4001A incorporates dual processors. It operates with the MPEG-1, MPEG-2, and MPEG-4 video compression standards. MPEG-2 encoding allows the data bit rate to remain low even with high image quality. Also, it can be matched into the local environment within wide limits. In this process, simultaneous encoding of the video signal according to MPEG-4 is supported so concurrent transmission using low bandwidth (for example, for Internet streaming) is possible. This flexibility lets you view a camera in one compression standard, for example, while recording in another compression standard if you wish.

SOFTWARE VERSION

This manual documents PelcoNet NET4001A software version 2.00.

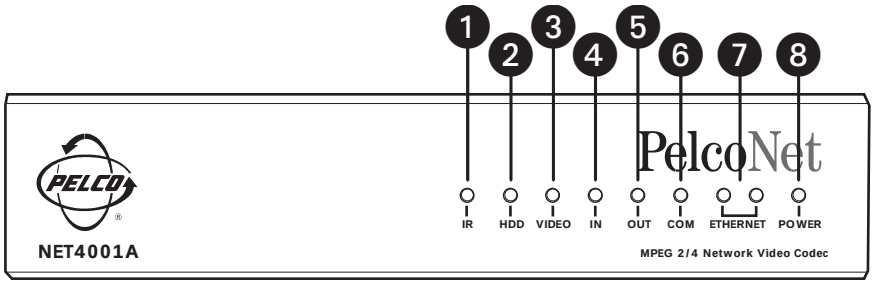
PACKAGE CONTENTS

The following are supplied:

Qty	Description
1	PelcoNet NET4001A
2	Power cables (USA and European)
1	RS-232 null modem cable
1	Patch cable
1	Software CD
1	Rack mount kit

Keep the carton, including the original packaging material, to repack the equipment if you need to return it for repair.

FRONT PANEL LEDS



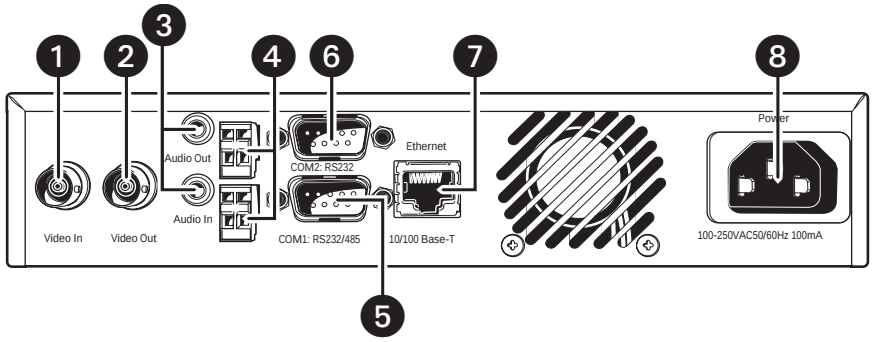
Key:

1 = **IR** (infrared) diode for future development.
2 = **HDD** LED. Not currently used.
3 = **VIDEO** LED lights green if a video signal is present on the input.
4 = **IN** LED lights red to indicate an active alarm or green to indicate a ready alarm.
5 = **OUT** LED lights green to indicate a switched relay.
6 = **COM** LED flashes orange during active data transmissions on the serial interface ports.
7 = **ETHERNET** green LED lights with a physical network connection while the red LED flashes when data packets are being transmitted.
8 = **POWER** LED flashes green to indicate the unit is operationally ready.

Figure 1. Front Panel LEDs

REAR PANEL CONNECTORS

Key:

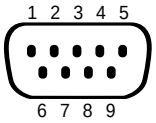


1 = **Video In** BNC socket for video source.
2 = **Video Out** BNC socket for an analog video monitor.
3 = **Audio Out** and **Audio In** 3.5 mm stereo jack sockets to connect an amplified microphone and loudspeaker.
4 = **Output** and **Input** connectors for switches for external equipment (for example, lights or audible alarms) or external sensors.
5 = Serial interface port COM 1 **RS232/485** 9-pin sub-D socket for control data transmissions (RS-232, RS-422, RS-485 protocols) and for configuration using terminal software.
6 = Serial interface port COM 2 **RS232** 9-pin sub-D socket for configuration using terminal software.
7 = **Ethernet** port accepts Cat5 cable with RJ-45 connectors for connecting to the network.
8 = **Power** socket for connecting the unit's power cord.

Figure 2. Rear Panel Connectors

NOTE: Use only the supplied power plug. If the cable or connector show any sign of damage, do not use the plug. Send it in for repair or replacement. Never try to use any power plug except the supplied one.

PIN ASSIGNMENTS



Pin	COM1		COM2
	RS-232	RS-232/485	RS-232
1	DCD (data carrier detect)	–	–
2	RxD (receive data)	RxD+ (receive data plus)	RxD (receive data)
3	TxD (transmit data)	TxD- (transmit data minus)	TxD (transmit data)
4	DTR (data terminal ready)	–	–
5	GND (ground)	GND (ground)	GND (ground)
6	DSR (data set ready)	–	–
7	RTS (ready to send)	TxD+ (transmit data plus)	–
8	CTS (clear to send)	RxD- (receiver data minus)	–
9	–	–	–

TYPICAL APPLICATIONS

DISPLAYING REMOTE VIDEO ON A WEB BROWSER

The NET4001A uses MPEG-2 and MPEG-4 for transmitting audio and video across the network. This enables transmission to standard web browsers of either live video (Live Video mode) or a stream of still images (Server Push mode).

- To activate the Live Video feature, click **Live Video** above the video window on the PelcoNet NET4001A transmission system home page (refer to Figure 3). The unit transmits using MPEG-2 or MPEG-4 format for display in the browser.

  To stop Live Video, click any other option at the top of the page.

- To activate the Server Push feature, click **Server Push** above the video window on the PelcoNet NET4001A transmission system home page. The unit continuously grabs snapshots to be JPEG encoded, transferred, and displayed continuously by the browser.

  To stop Server Push, click any other option at the top of the page.

The PelcoNet NET4001A transmission system can display live video to an infinite number of users at a time (multicasting).

Server Push can support multiple users simultaneously on the same transmitter. Image quality is good with an update rate of one image about every 2 to 10 seconds depending on the number of users and available bandwidth.

Browsers that do not support live video technology can display an updated still image or a stream of images in Server Push mode.

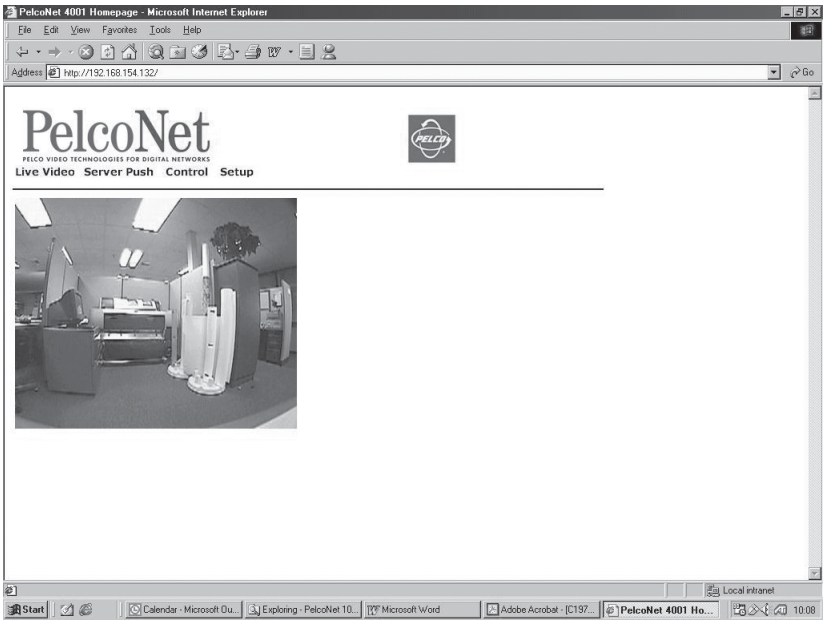


Figure 3. PelcoNet NET4001A Home Page

DISPLAYING VIDEO VIA A TRANSMITTER-TO-RECEIVER CONNECTION

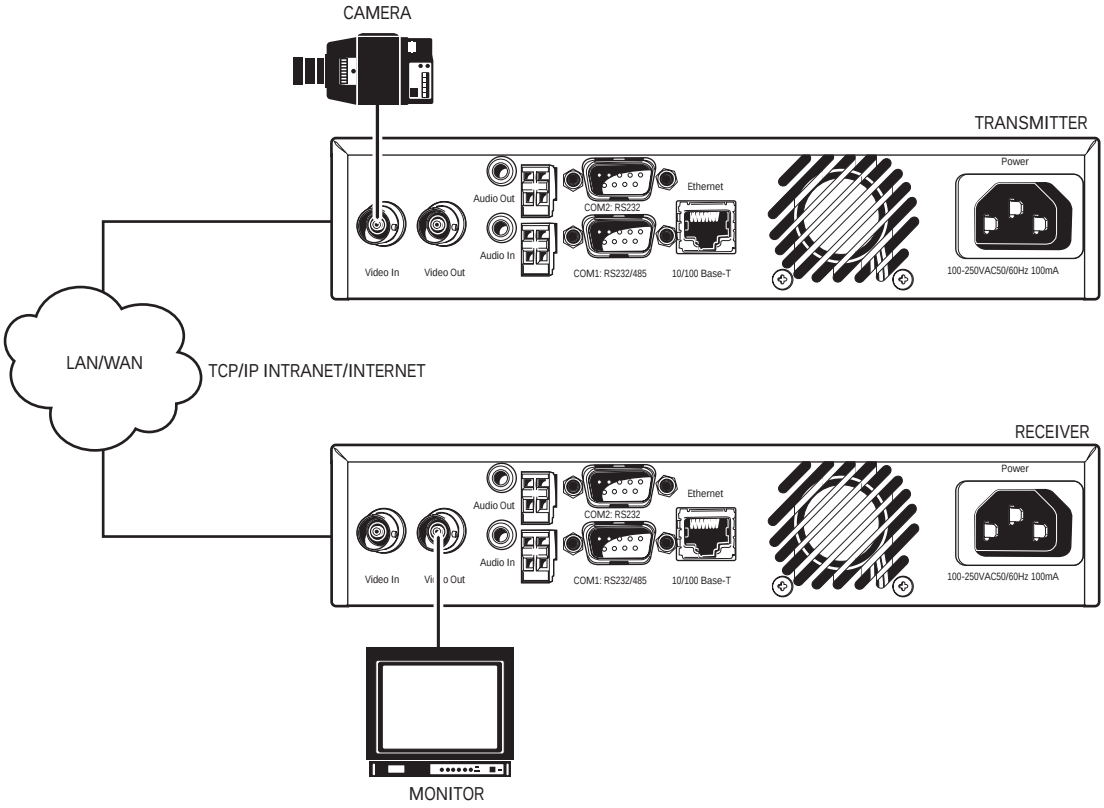


Figure 4. Configuration for Box-To-Box Connections

There are two ways to make a high performance multimedia transmission system for computer networks:

- One way is to use just the NET4001A as a transmitter and connect it through the computer network to a PC with a web browser at the receiving end.
- Another way is to connect a NET4001A as a transmitter through the computer network to another NET4001A as a receiver. This is often called a box-to-box connection because it uses two PelcoNet units.

In either case, routing dedicated cables from a camera to a monitor is not required because you can use an existing computer network for that purpose.

The following explains a box-to-box connection.

1. First, the NET4001A transmitter and receiver need to be configured appropriately. If the units are supposed to be operated in different subnets, a gateway IP address must be configured. Use the Live video receiver IP address field to address the destination. Enter the settings using either a terminal program or a web browser.
2. Once all addresses are configured, under the terminal program menu, go into the "Rcp+" menu and press **1** to make the connection. Or program the live video receive IP address and enable the live auto connect setting through the web browser. Make sure the unit that will initiate the connection has an alarm IP address that points to the destination unit. After a few seconds, video transmission begins and the camera scene appears on the monitor attached to the receiver.

   Instead of using a terminal program or web browser for establishing a connection, you can attach a contact to the alarm input. Make sure the alarm input is enabled.

You can use a web browser to connect to either of the two units, even during an active box-to-box connection. This way you can make changes to the configuration and immediately see the result of the setting (for example, when changing video quality). (This is not true for passwords, however.) If you are connected to the transmitter, the camera pictures are sent to the receiver and web browser simultaneously. There will be a short break in the video display on the receiver monitor whenever the web browser requests a new frame. This is especially noticeable with the Server Push feature.

Full-duplex audio can be transmitted in parallel with the video transmission. To do so, you need to use the web browser to enable audio on the Video Encoder Settings MPEG-1/-2 page.

Transparent data is always transmitted automatically between the two units as soon as the connection becomes active. Data bytes entering the interface are transported to the other end transparently. There is no flow control mechanism for the data channel. Overflowing the serial interface will cause data loss.

To sever the connection from either end, in the "Rcp+" menu press **3** (or disable the alarm).

DIAGRAMS OF TYPICAL APPLICATIONS

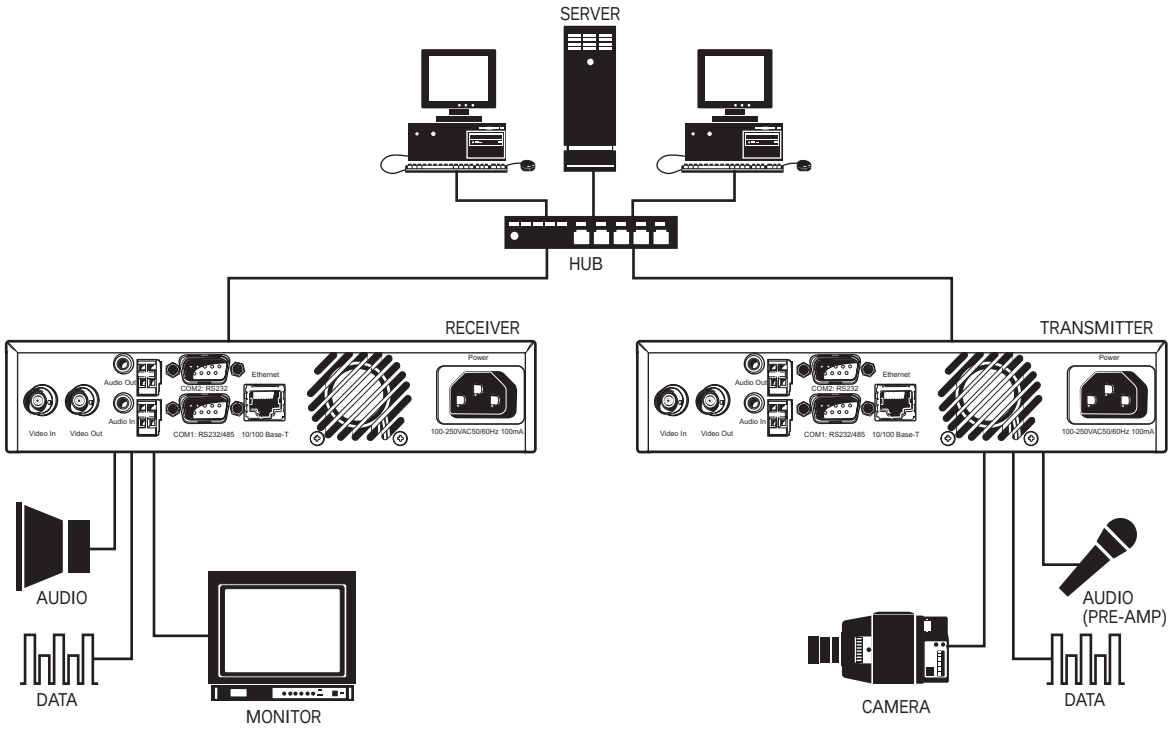


Figure 5. LAN Box-To-Box Connection (Transmitter, Receiver, Fixed Camera)

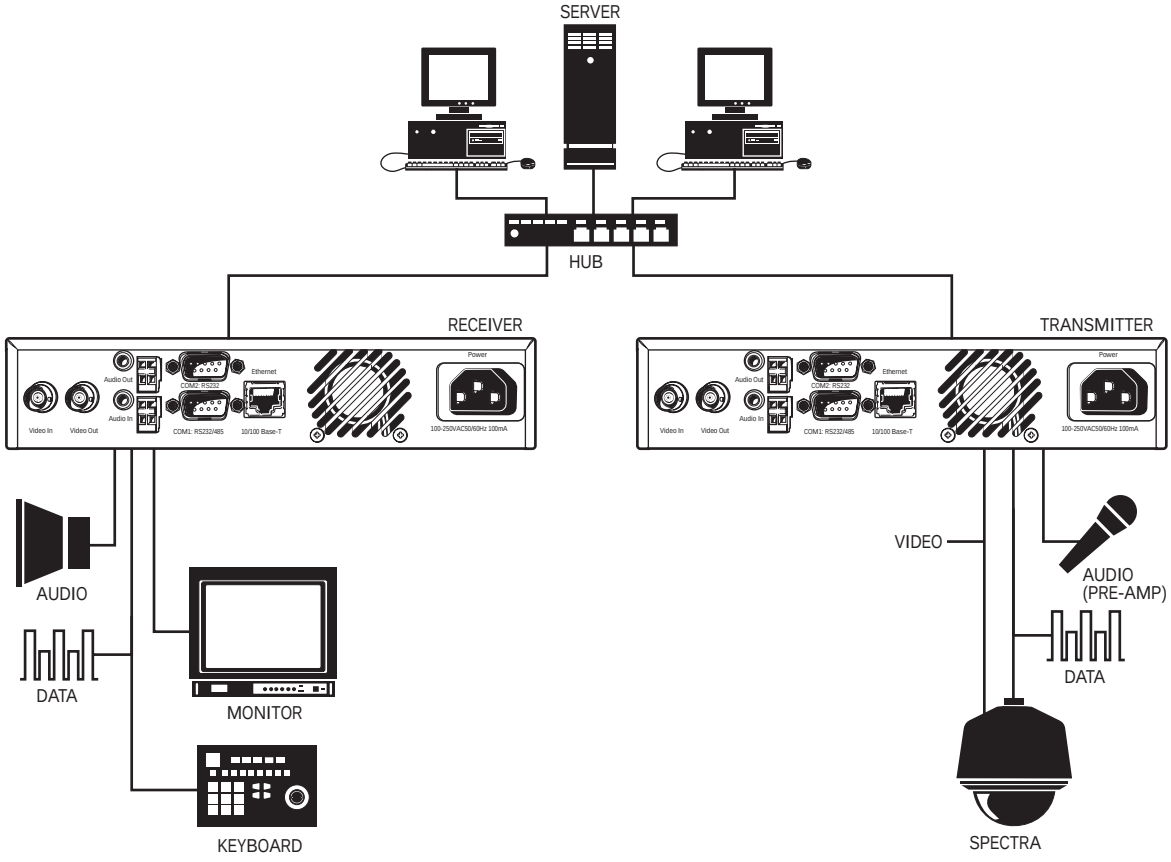


Figure 6. LAN Box-To-Box Connection (Transmitter, Receiver, Spectra)

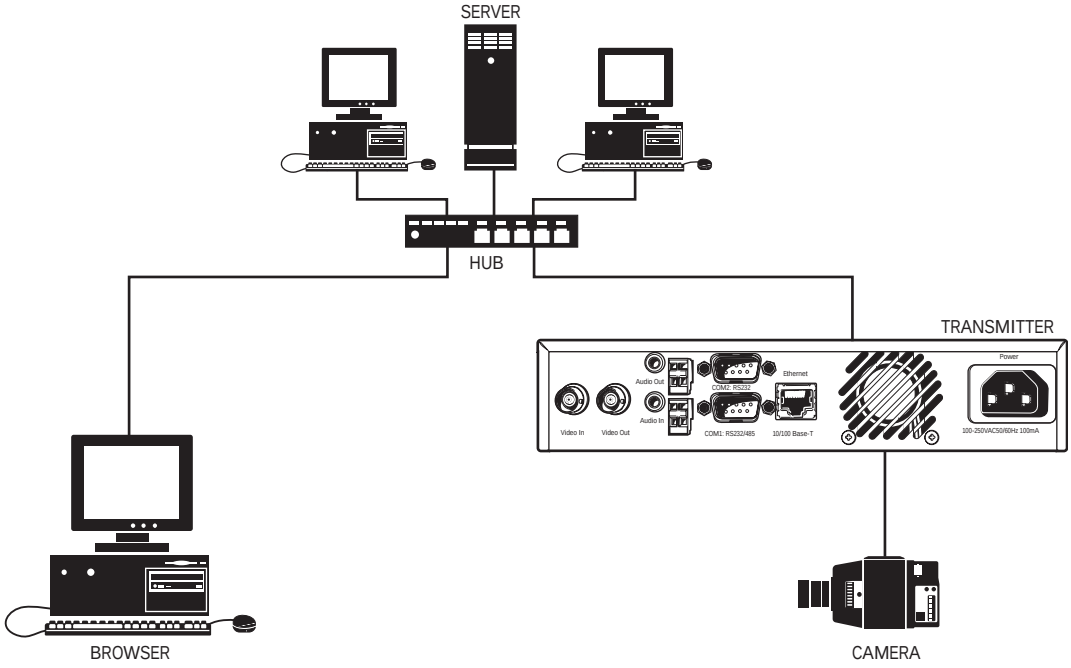


Figure 7. LAN Browser-To-Box Connection (Transmitter, Browser, Fixed Camera)

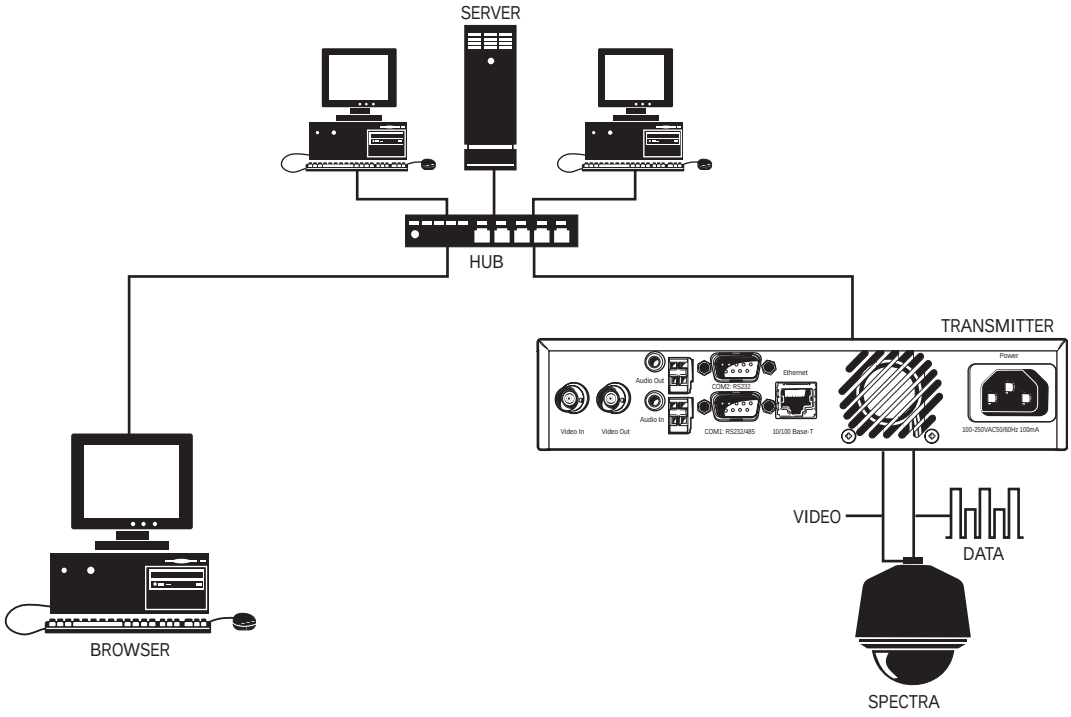


Figure 8. LAN Browser-To-Box Connection (Transmitter, Browser, Spectra)

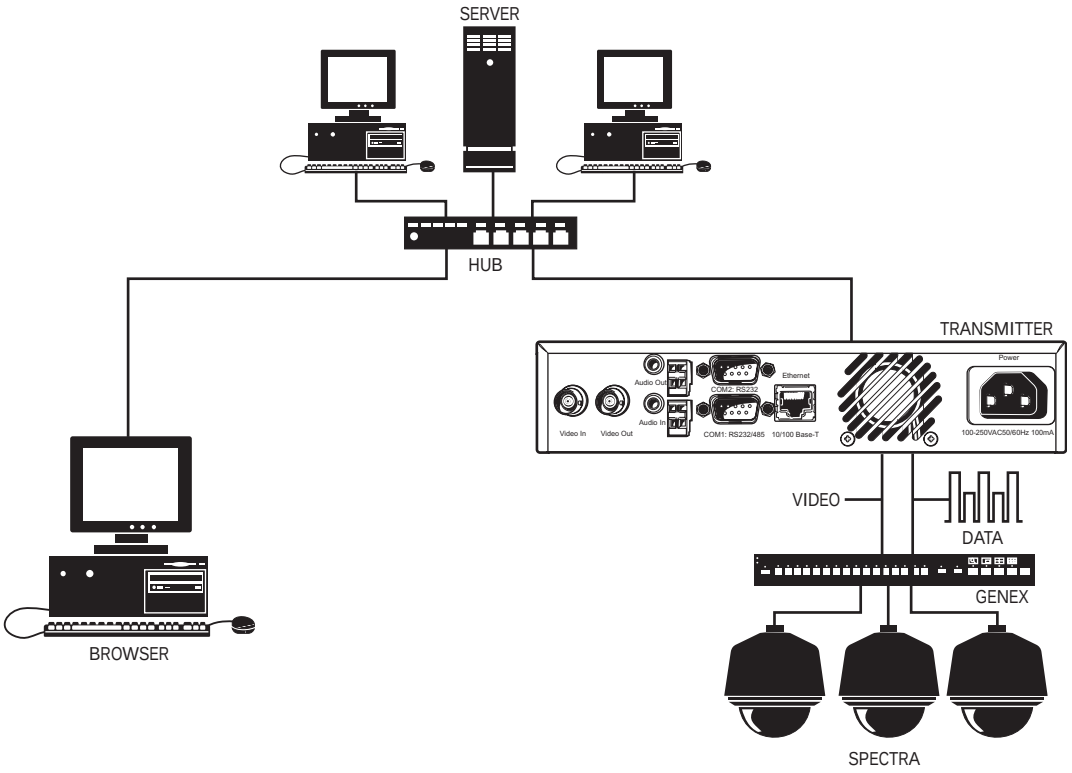


Figure 9. LAN Browser-To-Box Connection (Transmitter, Browser, Spectra, Genex)

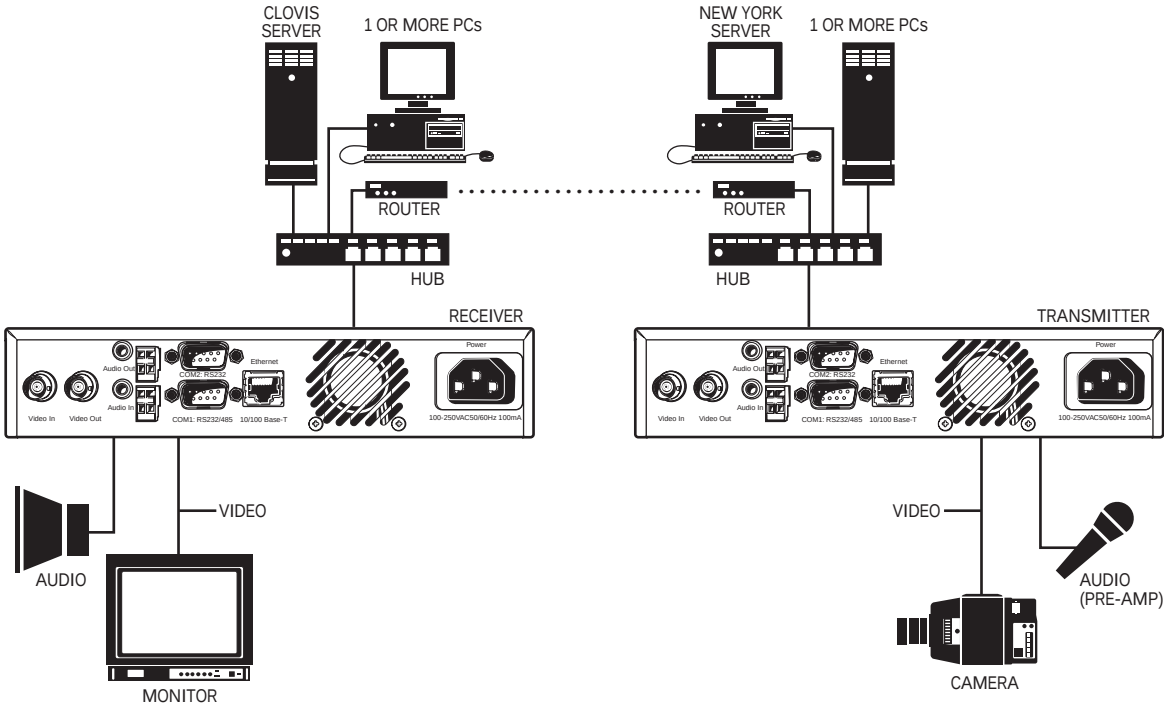


Figure 10. WAN Box-To-Box Connection (Transmitter, Receiver, Fixed Camera)

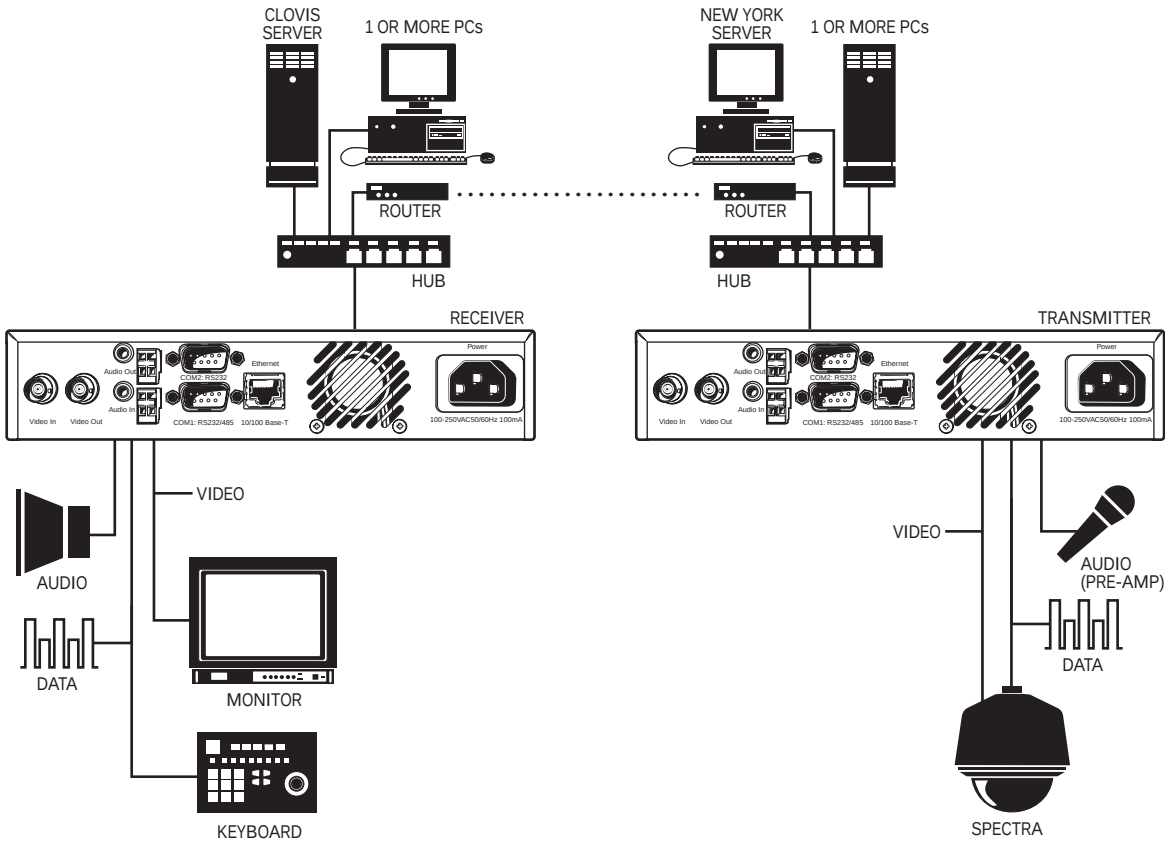


Figure 11. WAN Box-To-Box Connection (Transmitter, Receiver, Spectra)

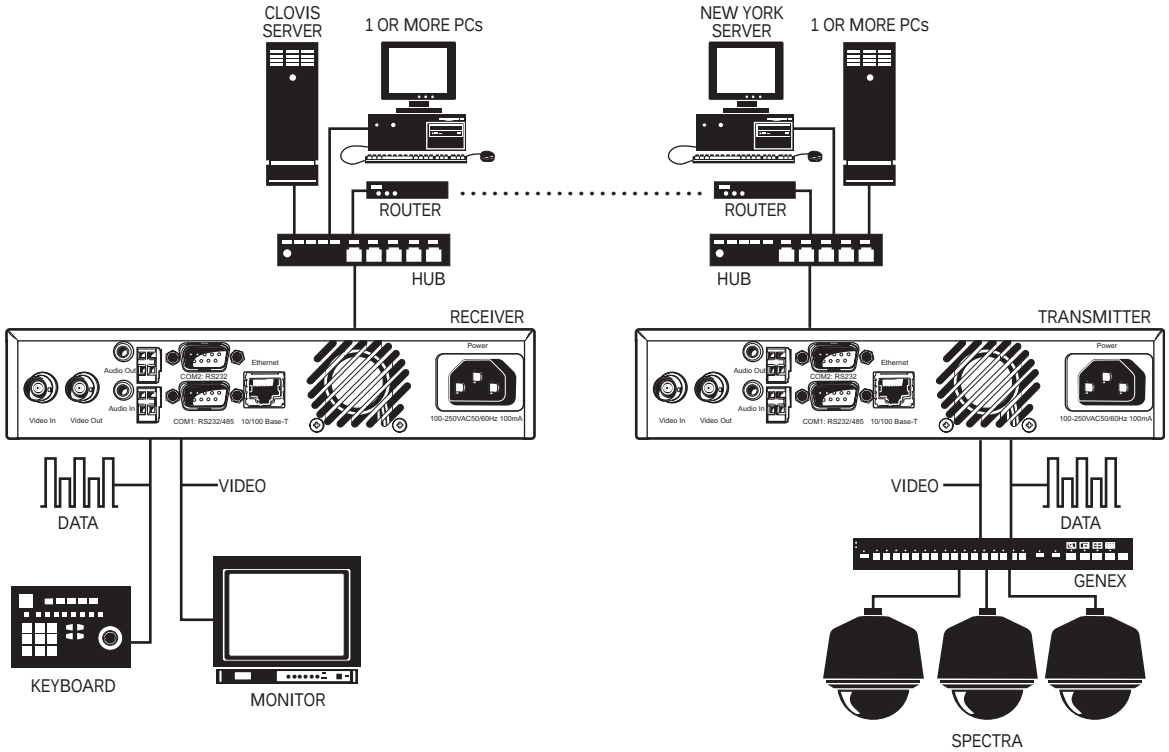


Figure 12. WAN Box-To-Box Connection (Transmitter, Receiver, Spectra, Genex)

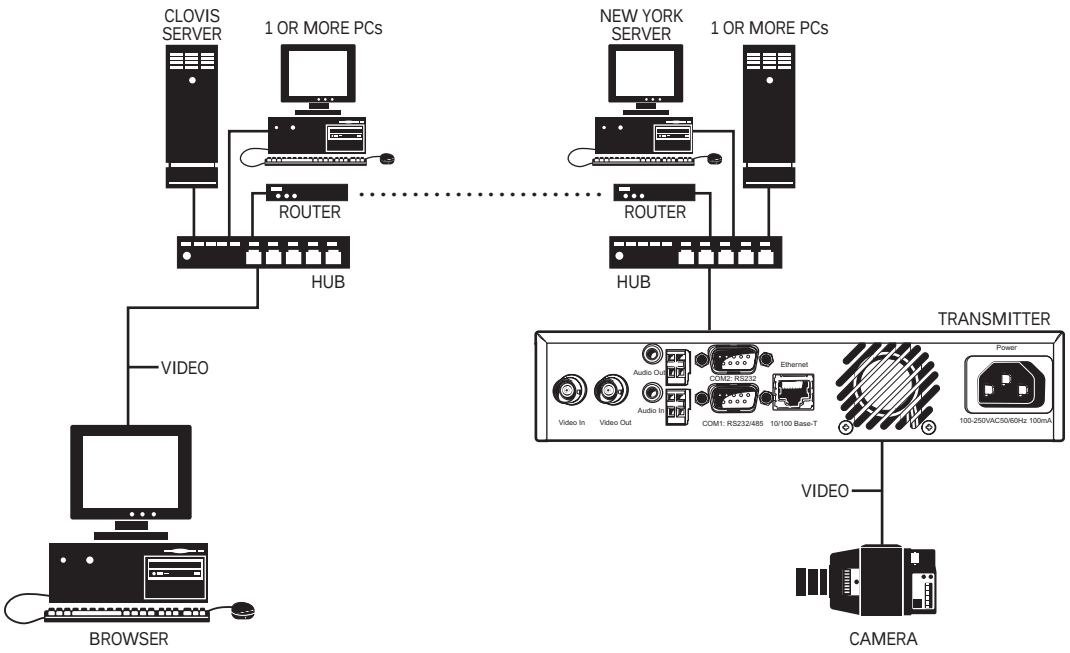


Figure 13. WAN Browser-To-Box Connection (Transmitter, Browser, Fixed Camera)

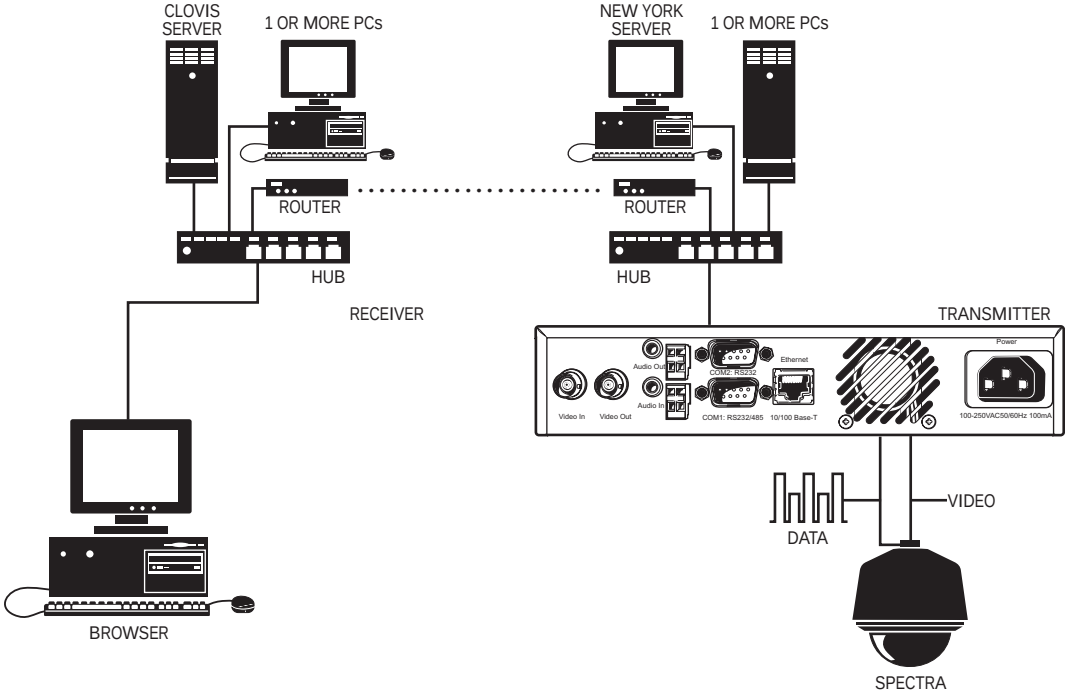


Figure 14. WAN Browser-To-Box Connection (Transmitter, Browser, Spectra)

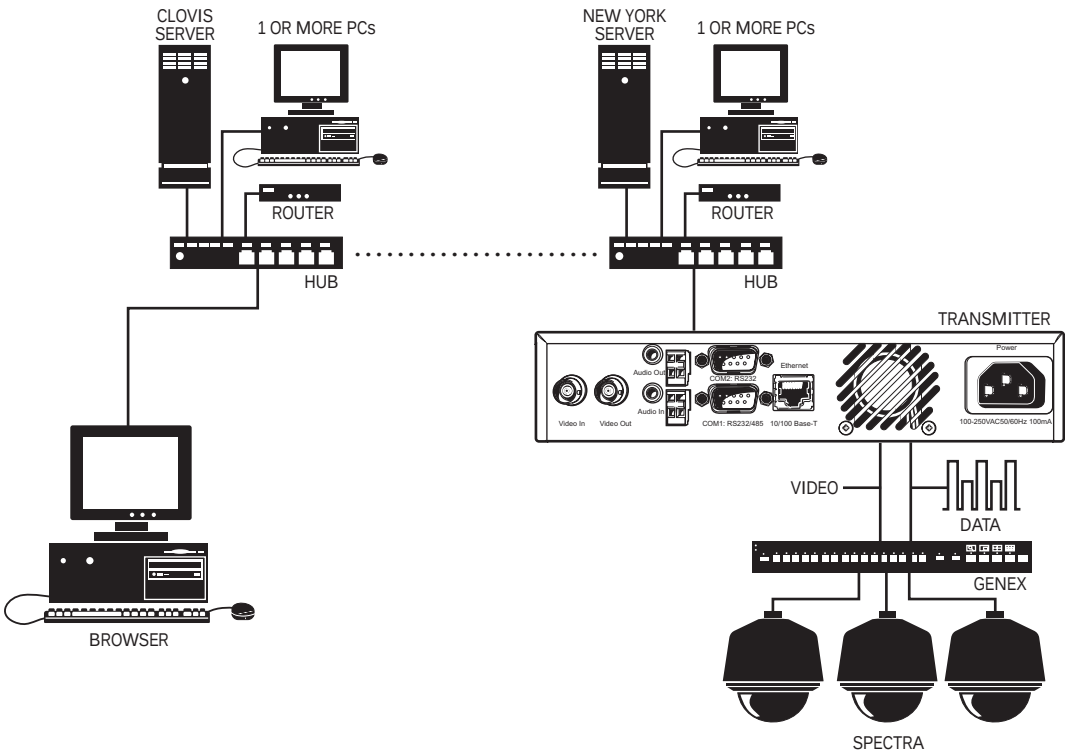


Figure 15. WAN Browser-To-Box Connection (Transmitter, Browser, Spectra, Genex)

HARDWARE INSTALLATION

Refer to *Appendix A – Connecting PelcoNet NET4001A To Different Components* for diagrams that show various connections.

RACK MOUNTING

If desired, rack mount one or two NET4001A units on a single shelf of a standard 19-inch equipment rack using the supplied rack mount kit.

MOUNTING A SINGLE UNIT

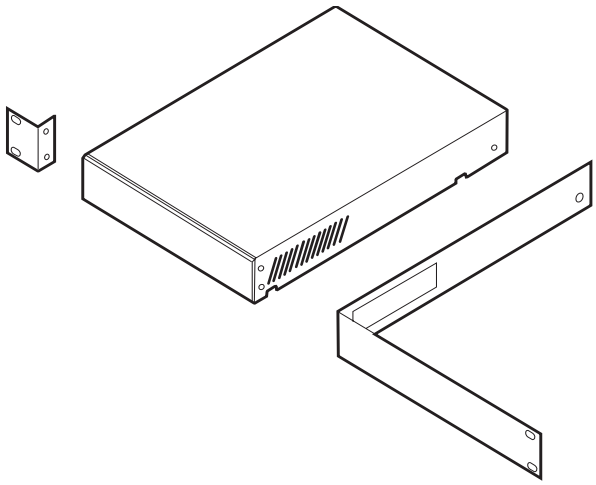


Figure 16. Mounting One Unit

Refer to Figure 16. Use one short and one long angle bracket from the mounting kit. Do the following:

1. Screw the two brackets to the sides of the unit housing using the supplied small black screws in the bag that comes with the rack mount kit.

2. If necessary, remove the rubber feet from the unit's base if other equipment will be mounted directly underneath.

3. Mount the unit in the rack and secure the angle brackets using four screws. (Leave cooling space of two inches [5 cm] on each side and 4 inches [10 cm] at the rear.)

4. Plug the supplied power cable into the **Power** socket on the rear of the unit.

MOUNTING TWO UNITS

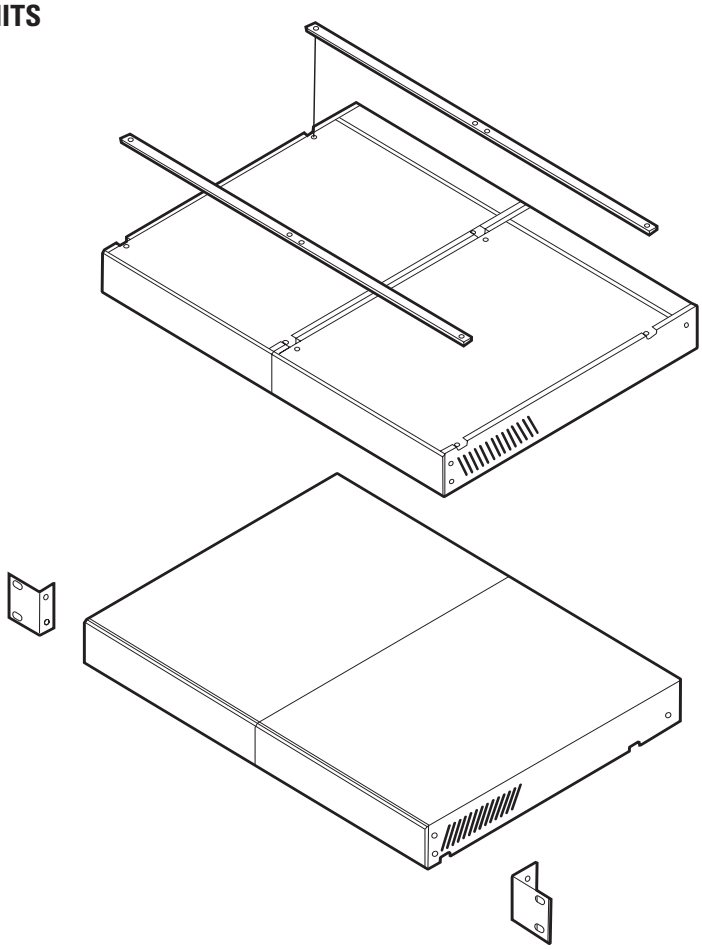


Figure 17. Mounting Two Units

Refer to Figure 17. Use the two short angle brackets and two rails from the mounting kit. The two units must first be bolted together. Do the following:

1. Turn the two units upside down. Lay them alongside each other and secure the two rails to the units using four supplied chrome screws for each unit. Turn them right side up.

2. Screw the two short angle brackets to the outside of the two units using the four supplied small black screws.

3. If necessary, remove the rubber feet from the unit's base if other equipment will be mounted directly underneath.

4. Mount the units in the rack and secure the angle brackets using four screws. (Leave cooling space of two inches [5 cm] on left and right sides and 4 inches [10 cm] at the rear.)

5. Plug the supplied power cables into the **Power** sockets on the rear of the units.

CONNECTING VIDEO SOURCES OR DISPLAYS

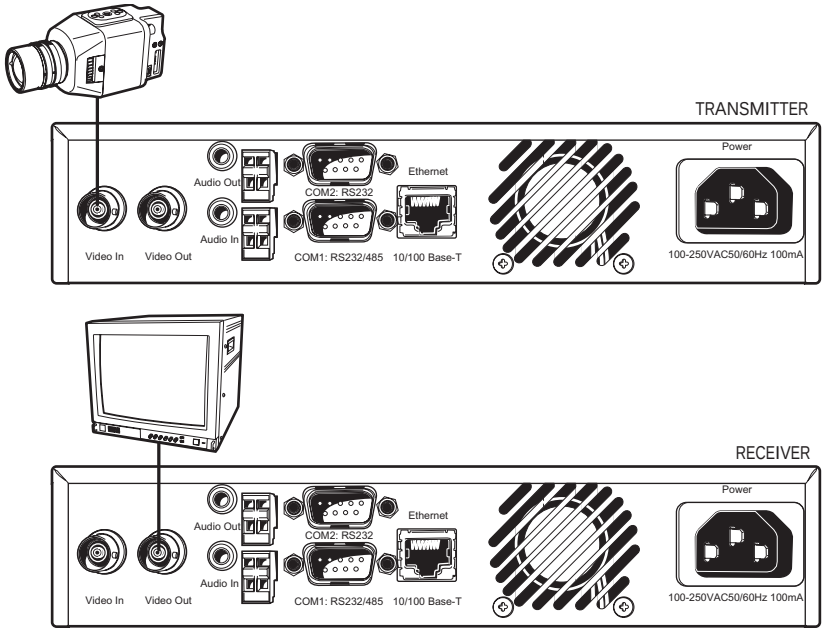


Figure 18. Connecting Camera or Monitor

Refer to Figure 18. To connect a camera, plug a standard coaxial cable into the Video In BNC connector on the rear of the NET4001A and the other end into the camera. You can use any video source (for example, a VCR) with a composite PAL or NTSC output. The input accepts color or black and white sources and automatically detects whether it is PAL or NTSC. The video input has an internal termination of 75 ohms.

CONNECTING A MONITOR

Refer to Figure 18. To connect a monitor, plug a 75-ohm video cable into the Video Out BNC connector on the rear of the NET4001A being used as a receiver and the other end into the monitor. This works with any suitable PAL or NTSC monitor. Select PAL or NTSC in the Video Decoder Settings configuration page.

CONNECTING AUDIO EQUIPMENT

The NET4001A provides an audio channel via the audio in and out jacks.

1. Connect a pre-amplified microphone to the Audio In jack on the transmitter and/or receiver.

2. Connect a loudspeaker to the Audio Out jack on the transmitter and/or receiver.

The audio signals are transmitted bi-directionally and simultaneously with the video signals. This allows control of a loudspeaker or door intercom system, for example, at the monitored location. Bi-directional audio applies to box-to-box connectors only. MPEG2 should be selected in order to receive a good audio signal.

CONNECTING DATA TERMINALS

The bi-directional data interface ports can be used as control ports for equipment connected to the NET4001A (for example, a dome camera with motorized lens).

USE AS CONTROL TERMINAL PORT

For local control and configuration of the unit, you can connect the COM port of a data terminal (for example, a PC running a standard terminal program) to COM 1 on the NET4001A.

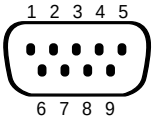
You can use a standard terminal program to communicate with the unit. The default parameters are set to 19200 baud, 8 bits of data, 1 stop bit, and no parity (8N1).

For more information on the command set, see the *Configuration* section. This mode allows the control port to be used to send serial data that requires flow control.

You can configure the RS-232 half-duplex mode in the web browser. The RTS and CTS signals are enabled for flow control.

If this RS-232 mode is chosen, the camera control data is transferred to this port. Certain cameras with fixed data length require the buffered RS-232 mode. (This half-duplex mode is not required for interfacing to any Pelco product.)

VIEWED FROM SOLDERING SIDE OF PLUG



Pin	Name	Direction	Description
1	DCD	Input	Data Carrier Detect
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	Data Terminal Ready
5	GND		Ground
6	DSR	Input	Data Set Ready
7	RTS	Output	Ready To Send
8	CTS	Input	Clear To Send
9	–	–	–

Figure 19. Control Terminal Port Pin Assignments in RS-232 Mode

USE AS TRANSPARENT DATA PORT

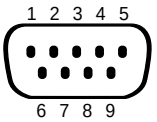
The COM 2 serial interface offers a transparent serial data channel between the receiver and the transmitter. A typical application for transparent data is remote control of peripheral equipment (for example, a dome system with PTZ functions). You also can use these channels to control remotely any external device with a serial interface. The serial data is transferred in parallel to the video and audio data.

Transmission of transparent data is enabled only after a video connection has been established. Also, the RS-232 interface for the transparent data port does not support hardware flow control.

For proper operation, you must configure the following: baud rate, parity of the interface of the PelcoNet NET4001A transmission system unit, and number of data and stop bits. Use a web browser to configure these parameters at the unit.

The transparent data interface is used to control PTZ cameras remotely, to transmit data transparently between the two units, or to control equipment connected to a PC COM port. Transmission of transparent data is possible only when the units are connected. Only the data transmit and receive signals are provided at this port.

VIEWED FROM SOLDERING SIDE OF PLUG



Pin	Name	Direction	Description
1	–		N.C.
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	–		N.C.
5	GND		Ground
6	–		N.C.
7	–		N.C.
8	–		N.C.
9	–		N.C.

Figure 20. Data Port Pin Assignments in RS-232 Mode

CONNECTING EXTERNAL SENSORS

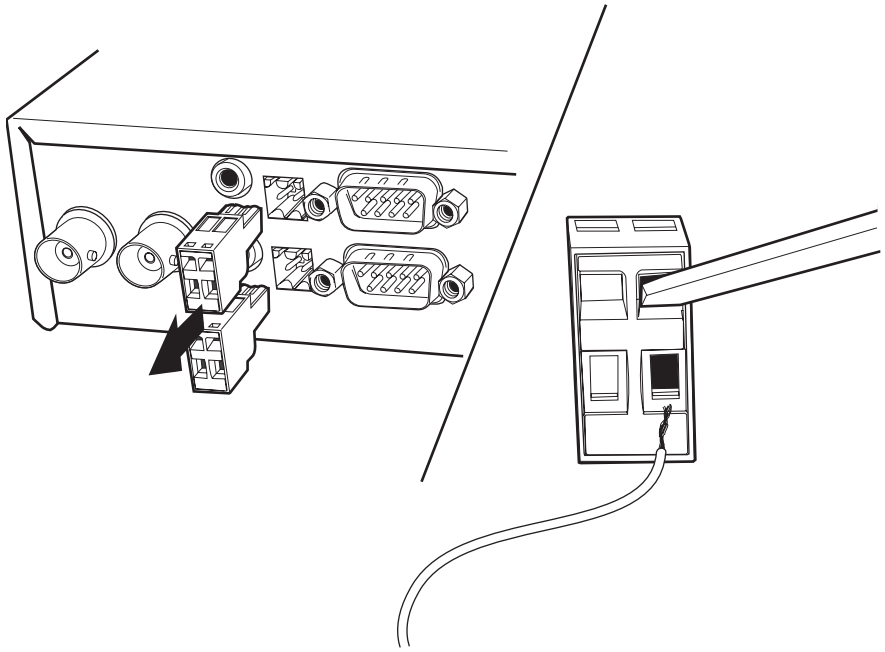


Figure 21. Connecting External Sensors and Peripheral Devices

The unit has an alarm input that lets you connect an external signaling device, like a door contact or motion detector. If configured accordingly, an alarm trigger can, for example, set up an automatic connection between NET4001A and the remote station. You can connect switches or contacts directly without a separate power supply.

Do the following to connect an external sensor. Refer to Figure 21.

1. Pull the Input (bottom) terminal block from its plug-in base.

2. Attach the conductor to the alarm input terminal. Either terminal will work. A ground conductor can be attached to the remaining terminal if needed. (Insert a small screwdriver tip in the top square hole and push hard enough to open the lower hole. Insert the wire in the lower hole.)

3. Push the terminal block back on to the plug-in base.

CONTROLLING PERIPHERAL DEVICES

The NET4001A has an output for switching an external device (for example, a light or siren). The relay can be operated interactively, during an active connection, or automatically to coincide with certain events. Settings for the relay must be configured (refer to the *Configuration* section).

Typical applications of the relay output are activating door openers or switching of lights and other electrical devices. Do not exceed the maximum rating of 40V and 0.8A.

Do the following to connect a peripheral device. Refer to Figure 21.

1. Pull the Output (top) terminal block from its plug-in base.

2. Attach the conductor to the output terminal. Either terminal will work. A ground conductor can be attached to the remaining terminal if needed. (Insert a small screwdriver tip in the top square hole and push hard enough to open the lower hole. Insert the wire in the lower hole.)

3. Push the terminal block back on to the plug-in base.

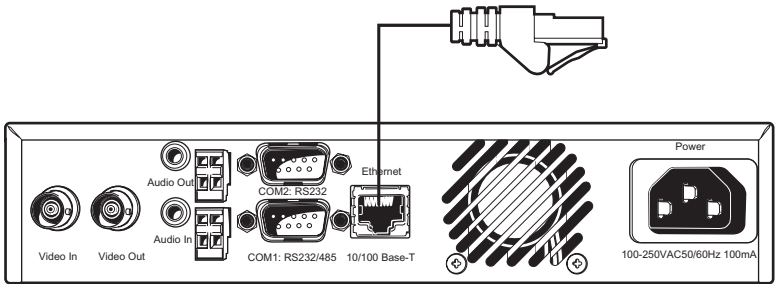


Figure 22. Connecting to the LAN Port

Refer to Figure 22. To connect a 10/100 BASE-T network, plug a standard UTP/Cat5 cable with RJ-45 connectors into the receptacle labeled Ethernet on the NET4001A. You can connect directly to the Ethernet network. The green ETHERNET LED on the front of the unit (refer to Figure 1) lights as soon as the connection to the network is correct physically and synchronized with the LAN. Check the cable or refer to the *Troubleshooting* section if the LED does not light.

The second ETHERNET LED flashes red when data is transmitted.

CONFIGURATION

There are three ways to configure your system:

- The most basic configuration is accomplished by connecting a terminal to the RS-232 terminal port. You then type in commands and parameters. Refer to the *Configuration Using a Terminal Program* section.
- Another way is to use the Telnet command and IP address from your PC to access the same interface as the terminal program. (Click the **Start** button at the bottom of your PC screen, click **Run**, type **command**, type **telnet** and the IP address.) You can then follow the instructions in the *Configuration Using a Terminal Program* section.
- A more convenient, complete configuration and display of video is through the built-in HTTP server, which connects to any standard web browser (for example, Internet Explorer). You then configure using screens and menus. This is the recommended method. Refer to the *Configuration Using a Web Browser* section.

CONFIGURATION USING A TERMINAL PROGRAM

Using a terminal program (for example, the Windows application HyperTerminal) connected to the RS-232 terminal port on the unit's rear panel provides limited configuration and control capabilities (null modem cable required). Ensure that the PC's COM port is set up properly (default properties are 19200 baud, 8N1) and that the local terminal echo is disabled.

Do the following:

1. Connect the COM 1 on the NET4001A to an unused serial port on the PC.
2. After the connection is made, you will be prompted for the case-sensitive username (**service**).
3. All commands consist of single characters you type inside the terminal window. Enter only one command at a time and do not terminate this input by pressing the Enter key. After entering a value (for example, an IP address), check the entered characters again and only then press Enter to transmit the values to the NET4001A.

The following section shows a typical session.

TYPICAL SESSION

The terminal program menu appears as follows in the terminal window. Refer to the *Terminal Program Menu Structure* section for more information.

VJ1000 (172.16.0.80)

'0' Main Menu
'1' IP
'2' MPEG-2 encoder
'3' MPEG-4 encoder
'4' Misc
'5' Rcp+
'6' logout

NOTE: You cannot use backspace during a terminal session—if you mistype a character, end your entry by pressing Enter and try again. If you see duplicate characters on any entry, the "local echo" feature of your PC's terminal program is not disabled.

If you are using the terminal to set up the unit's IP address, just type **1** and then type **1** again. You are prompted to enter a new IP address:

local IP (*) 192.168.01→192.168.0.2 [Enter]

If you want to establish a live video connection to a remote unit, you have to specify the remote IP address by typing **5** and then entering the remote IP address in the same manner as the unit IP address as shown in the example above.

To establish a connection, go to the menu, and then press **5**, and then **1**. To disconnect, press **3** in the same menu.

TERMINAL PROGRAM MENU STRUCTURE

The following describes the terminal program menu structure.

Main Menu

'0' Main Menu
'1' IP
'2' MPEG-2 encoder
'3' MPEG-4 encoder
'4' Misc
'5' Rcp+
'6' logout

1 – IP Menu

The selections and format are shown below. Enter the appropriate information where indicated by the quotation marks, but do not enter the quotation marks. An asterisk (*) means a reset after a change is necessary.

NOTE: When you change the IP address, subnet mask, or gateway IP address either through HyperTerminal or the browser, the system needs to be rebooted by cycling the power.

'0'	Exit menu IP	
'1'	local IP	(*) 172.160.0.80 -> 'new IP address' [Enter]
'2'	local subnet mask	(*) 255.255.0.0 -> 'new subnet mask' [Enter]
'3'	local gateway	(*) 0.0.0.0 -> 'new gateway IP address' [Enter]
'4'	tx multicast group	224.1.2.37 -> 'new transmit multicast group address' [Enter]
'5'	remote IP	172.16.0.17 -> 'new remote IP address' [Enter]
'6'	ntp server	0.0.0.0 -> 'new ntp server IP address' [Enter]
'7'	alarm IP	(access the Alarm IP Address menu)

7 – Alarm IP Address Submenu

'0' Exit menu alarm IP
'1' alarm IP [1] = 172.16.0.17
'2' alarm IP [2] = 0.0.0.0
'3' alarm IP [3] = 0.0.0.0
'4' alarm IP [4] = 0.0.0.0
'5' alarm IP [5] = 0.0.0.0
'6' alarm IP [6] = 0.0.0.0
'7' alarm IP [7] = 0.0.0.0
'8' alarm IP [8] = 0.0.0.0
'9' alarm IP [9] = 0.0.0.0
'a' alarm IP [10] = 0.0.0.0

2 – MPEG-2 Encoder Menu (advanced MPEG-2 encoder settings)

'0'	Exit MPEG-2 configuration	
'1'	current par	6 [1,2…8]
'2'	name	5 MBPS high quality
'3'	set defaults	
'4'	bitrate	5000 [KBps]
'5'	GOP Structure	4 [1=I, 2=IP, 3=IPB, 4=IPBB]
'6'	GOP Length	15 [n]
'7'	streamtype	1 [1=VES, 3=PRG]
'8'	skip ratio	1 [n]
'9'	resolution	3 [0=QCIF, 1=CIF, 2=2CIF, 3=4CIF]
'a'	MPEG-1	0 [1=MPEG-1, 0=MPEG-2]

3 – MPEG-4 Encoder Menu (advanced MPEG-4 encoder settings)

'0'	Exit MPEG-4 configuration	
'1'	current par	1 [1,2…8]
'2'	name	high quality (CIF)
'3'	set defaults	
'4'	bitrate	1000 [KBps]
'5'	I-frm dist	0 [n]
'6'	skip ratio	1 [n]
'7'	resolution	1 [0=QCIF, 1=CIF]

4 – Misc Menu

'0'	Exit Misc configuration	
'1'	mac address	(lists PelcoNet unit's MAC address)
'2'	video out	2 [1=PAL, 2=NTSC] -> 'set the video out' [Enter]
'3'	change username	login, enter username -> 'new username' [Enter]
'4'	passwords	(access password menu)
'5'	test	(access test menu)
'6'	timezone [sec]	28800 -> 'new timezone' [Enter]

4 – Password Submenu

'0'	Exit password settings	
'1'	live	live -> 'new live password' [Enter]
'2'	user	user -> 'new user password' [Enter]
'3'	service	service -> 'new service password' [Enter]

5 – Test Submenu (allows full testing of the unit)

'0'	Exit Test
'1'	boot history
'2'	video
'3'	audio
'4'	COM 1 232
'5'	COM 1 485
'6'	RTC
'7'	LED
'8'	ALARM
'9'	PHY
'a'	format HDD
'b'	FLASH
'c'	self test

5 – Rcp+ Menu

'0'	Exit menu rcp+	
'1'	connect to remote host	172.16.0.17 (connects to remote host)
'2'	coding standard	MPEG-4 (toggles MPEG-2/MPEG- 4)
'3'	disconnect all local connections	(disconnects all live connections to the unit)
'4'	display connection list	(displays all connections to the unit)
'5'	autoconnect	OFF (toggles autoconnect ON/OFF)
'6'	direction	outgoing (toggles outgoing/incoming/bi-directional)
'7'	protocol	UDP (toggles TCP/UDP)

CONFIGURATION USING A WEB BROWSER

In addition to the aforementioned configuration using a terminal program, which only covers the most basic settings, a web browser is the tool of choice for a more complete configuration. To accomplish this, the system features a complete HTTP server.

Microsoft Internet Explorer 5.5 or higher is the recommended browser.

WEB SERVER CONCEPT

1. Start your web browser.

2. Connect to the URL **http://IP-Address**, where IP-Address is the IP address of the unit you want to configure. Use the standard dot-separated format (x.x.x.x) to enter the address. The home page is displayed along with the video from the camera.

The HTTP server provides nine separate pages for configuration.

You can return to the home page from any other page by clicking the PelcoNet log. Clicking the Pelco® logo while on the home page immediately transfers you to the Pelco Internet home page, provided the network allows for Internet access.

In order for live video images to be decoded, the special ActiveX control file must be installed on your PC. The latest version of ActiveX comes on the PelcoNet CD.

ONLINE HELP

To access the online help files, click **Help on this page?**

QUICK GUIDE TO THE MENU STRUCTURE

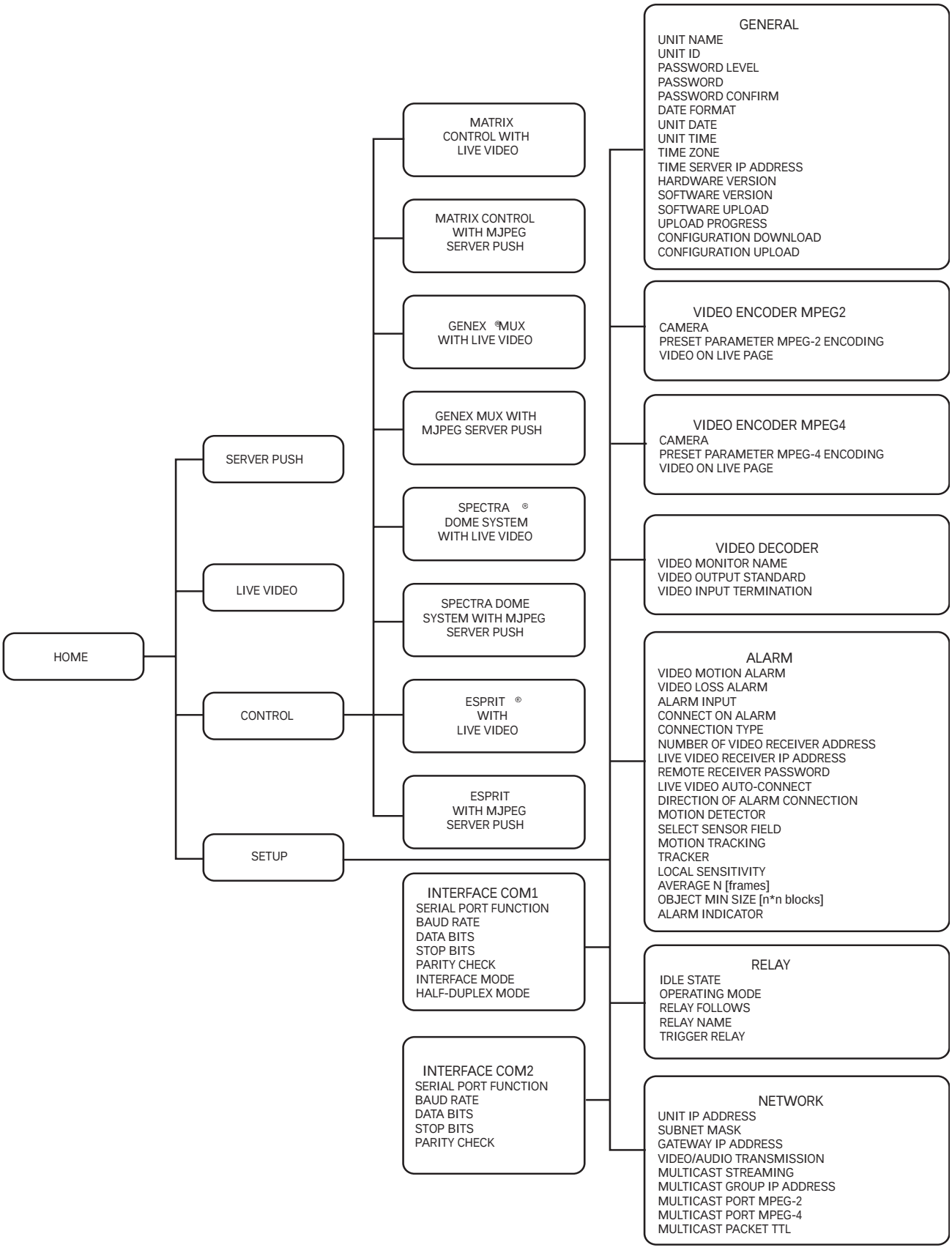


Figure 23. PelcoNet NET4001A Menu Tree

PELCONET NET4001A HOME PAGE

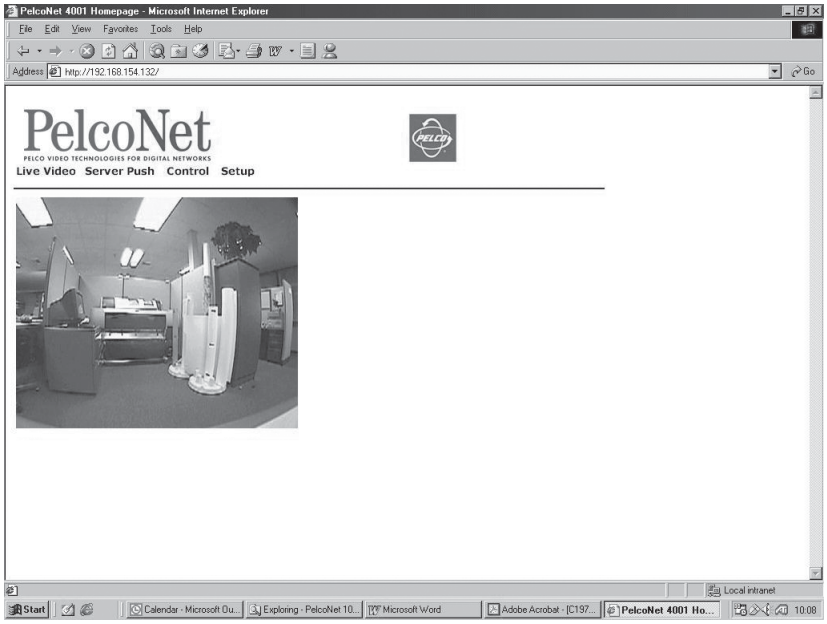


Figure 24. PelcoNet Home Page

The home page is the starting point for any configuration.

The window in the left of the screen is the display area for decoded video.

- Clicking the Pelco logo on any page connects you to the Pelco Internet home page (provided the LAN supports Internet access).
- Click **Live Video** to choose a live display or **Server Push** for periodically updated stills.
- Click **Control** to access an options screen with links to pages where you can see and control the displayed view. (Refer to the *Web Browser Control Pages* section.)
- Click **Setup** to access an options screen with links to configuration pages. Click any icon on the side or the text itself to transfer to the desired page.

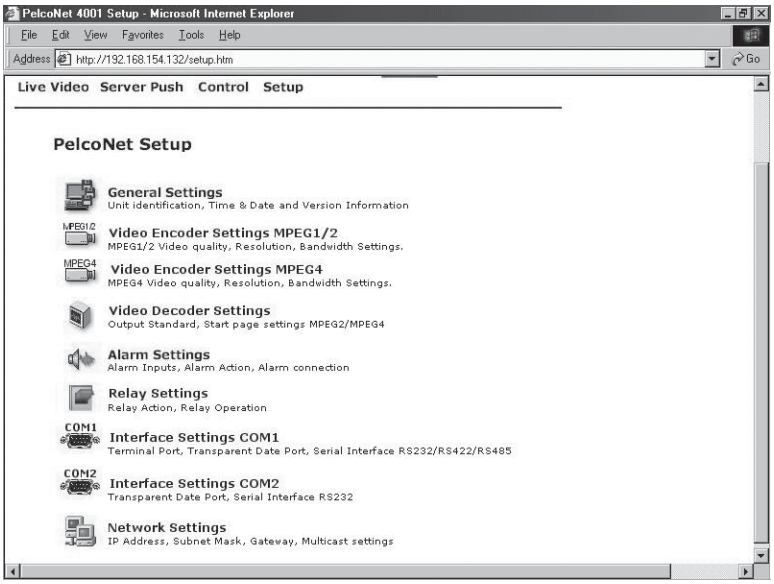


Figure 25. PelcoNet NET4001A Transmission System Setup Page

NOTE: When changing any configuration item in one of the following pages, make sure to change a single item at a time. Then click the respective Set button. If more than one item needs to be changed, execute the procedure repeatedly. If more than one item is changed without clicking the Set button in between, only the entry associated with the clicked button is actually changed. All other entries return to their previous settings.

All configuration items are stored in non-volatile memory so they are kept when the unit is powered down.

Some configurations apply only to transmitters (for example, camera settings) while others apply to receivers. All settings not expressly restricted to certain models apply to all.

CONFIGURATION PAGE FOR GENERAL SETTINGS

The unit identification, password, date and time, timer server, and software update settings, as well as version information, comprise the General Settings configuration page.

All units have a real-time clock set during manufacture. However, time and date can be changed any time; for example, when the units are operated in different time zones.

Version numbers for the hardware and firmware are for information only. Whenever you need technical support, have these numbers ready.

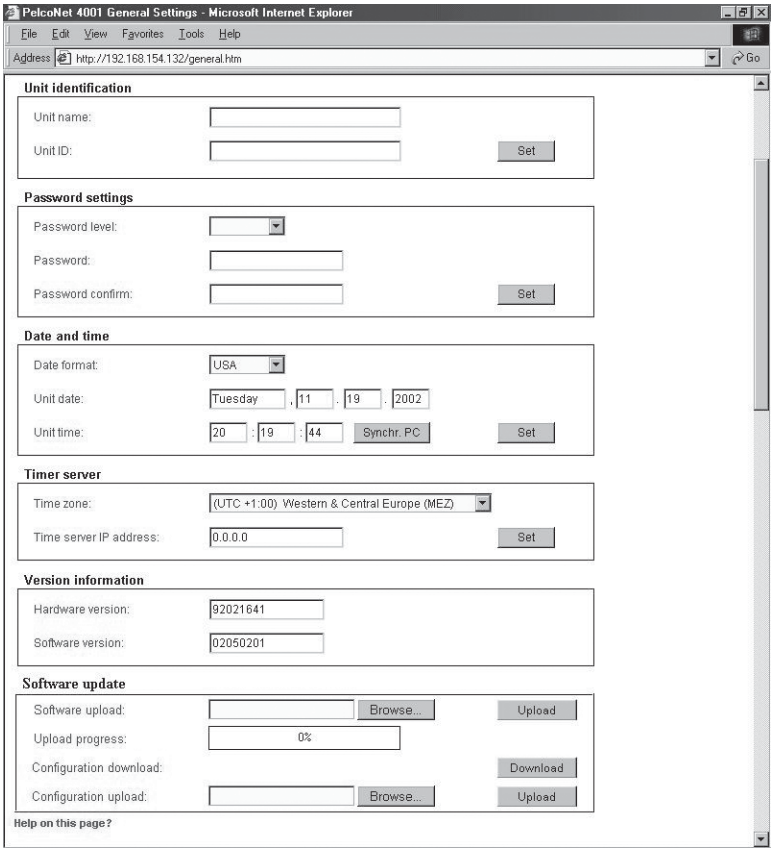


Figure 26. Configuration Page for General Settings

Table A. General Settings

Configuration Item	Default Setting	Description
Unit Name	None	The Unit name and Unit ID identify the device; for example, in the event of an alarm call. (For future development.)
Unit ID	None	The ID serves as a machine-readable name. (For future development.)
Password level	None	Select the password level from the pull-down menu. Access to a NET4001A generally is protected with a password to prevent unauthorized use of the unit. The three levels are: • **Service:** This is the administrative, and highest level. This level grants access to all configuration parameters after the current password is entered. • **User:** This is the second highest level. This level lets the user view live video and access the control pages. • **Live:** This is the lowest level. This level does not grant access to configuration pages but allows the unit to be operated (for example, viewing video). If any password level is set, you will be always be required to log on to the NET4001A. For example, if a "live" level password is set and you view that unit through the browser, the unit will ask for a user name and password to access any configuration page. If you then try to access the setup page, the unit will again prompt for a user name and password. **IMPORTANT:** "Service" is an administrative account. If you do not set up a "service" password, then there is no point in setting up "user" or "live" passwords because a user can login to the unit as "service" and then eliminate the "user" and "live" passwords. Some scenarios that can occur are as follows: • If a password is set for the service level, then the only way to access the setup page is by logging on using the "service" user name and the "service" level password. • If no password is set for the service level, then you can log on with the "service" user name and no password or you can log on with the "live" user name and the "live" password you have selected. **WARNING:** Setting a "user" level password on a transmitter can cause complications on the receiver side in a box-to-box configuration. To avoid this, on the receiver's Alarm Settings configuration page enter the transmitter's IP address and user password in the appropriate fields (live video IP address and remote receiver password). If no "user" level password is set on a transmitter, then the receiver needs no setup.
Password	None	You can enter or change a password if the unit is accessed in the Service authorization level or if the unit is not protected by a password. Passwords can be changed one at a time only (that is, either Service, User, or Live). Maximum entry is 19 alphanumeric characters. All entered characters will be saved when you click **Set**; however, only eight asterisks will be displayed when you access the screen next time.
Password confirm	None	Re-enter the new password again to guard against typing errors. If the device is not protected by a password, the "No password set" message will be displayed.
Date format	Europe	Use the pull-down menu to select the format for the date: USA, Europe, or Japan.
Unit date	N/A	Enter the current date in MM/DD/YYYY format for the USA; DD.MM.YYYY for Europe; and YYYY/MM/DD for Japan. This is the system date, driven by the internal real-time clock. The day of the week (first entry box) need not be entered and will be automatically adjusted based on the given date.
Unit time	N/A	Enter the current time or click the **Synchr. PC** button to synchronize the NET4001A with your computer's system time. The system time is driven by the internal real-time clock.
Time zone	(UTC + 1.00)	Use the pull-down menu to select the time zone for the NET4001A. This and the Timer Server IP Address settings are important if the internal clock should be synchronized with the time received from a timer server on the Internet.
Time server IP address	0.0.0.0	Enter the IP address of an NTP server. The time and date are automatically synchronized every two hours.
Hardware version	N/A	Read-only hardware version number. This contains unique serial number, type of hardware, and revision.
Software version	N/A	Read-only firmware version number. This is important information should you need technical support.
Software upload	N/A	Units have flash EPROMs for firmware upgrades in the field. These upgrades can be done directly from the web browser. Enter the name of the file containing the upgrade, or locate it using the **Browse** button. Then click the **Upload** button.

Table A. General Settings (Continued)

Configuration Item	Default Setting	Description
Upload progress	0%	This field shows the percentage of the upload that has been completed.
Configuration download	N/A	Clicking the **Download** button saves the current configuration of the PelcoNet NET4001 transmission system to a PC file.
Configuration upload	N/A	This copies a file from a PC to the NET4001A. Enter the name of the file containing the configuration, or locate it using the **Browse** button. Then click the **Upload** button to overwrite the configuration with the configuration stored in the named file.

CONFIGURATION PAGE FOR MPEG 1/-2 VIDEO ENCODER SETTINGS

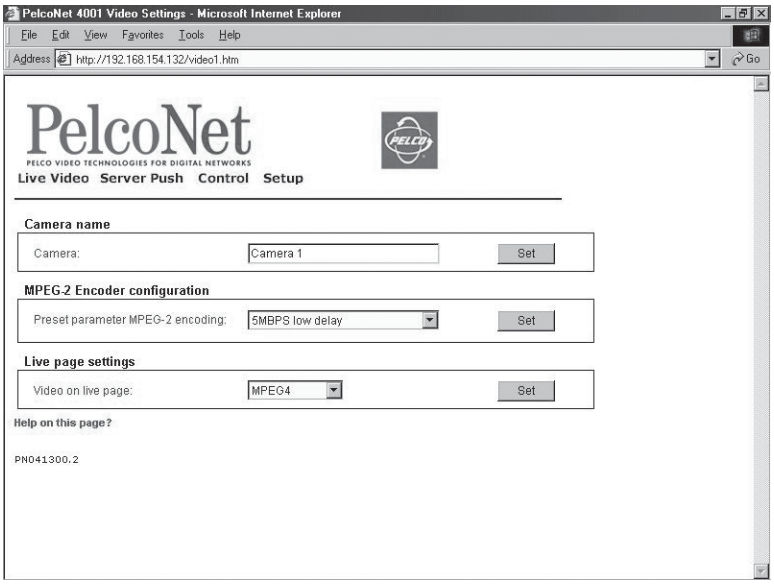


Figure 27. Configuration Page for MPEG 1/-2 Video Encoder Settings

MPEG-2 encoder and live page settings make up the configuration page for MPEG 1/-2 video encoder settings. The following table describes the configuration items.

Table B. Configuration Page for MPEG 1/-2 Video Encoder Settings

Configuration Item	Default Setting	Description
Camera	Camera 1	Enter a camera name (30 alphanumeric characters maximum). (This name is not displayed except on this configuration page. For future development.)
Preset parameter MPEG-2 encoding	2MBPS low delay	MPEG-2 data transmissions can be configured to suit the local operating environment (for example, network architecture, bandwidth, data structures). To help with this, several pre-programmed profiles with different features are provided. Select from the pull-down menu. • **2 MBPS low delay/3,5 MBPS low delay/5 MBPS low delay** 2 or 3.5 or 5 Mbps transmission rate with minimum delay on image refresh • **2 MBPS high quality/3,5 MBPS high quality/5 MBPS high quality** 2 or 3.5 or 5 Mbps transmission rate with highest picture quality • **2 MBPS with audio/3,5 MBPS with audio** 2 or 3.5 Mbps transmission rate with associated audio transmission
Video on live page	MPEG2	Select **MPEG2** from the pull-down menu.

CONFIGURATION PAGE FOR MPEG-4 VIDEO ENCODER SETTINGS

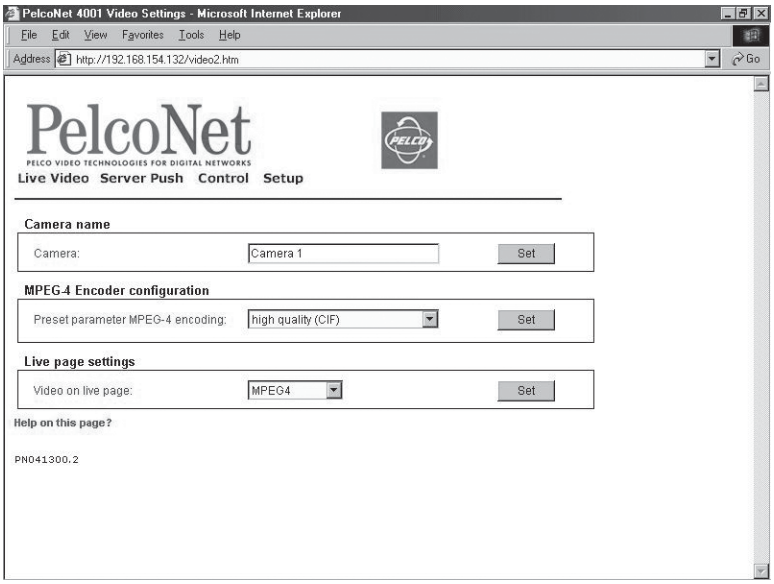


Figure 28. Configuration Page for MPEG-4 Video Encoder Settings

MPEG-4 encoder and live page settings make up the configuration page for MPEG-4 video encoder settings. The following table describes the configuration items.

Table C. Configuration Page for MPEG-4 Video Encoder Settings

Configuration Item	Default Setting	Description
Camera	Camera 1	Enter a camera name (30 alphanumeric characters maximum). (This name is not displayed except on this configuration page. For future development.)
Preset parameter MPEG-4 encoding	high quality (CIF)	MPEG-4 data transmissions can be configured to suit the local operating environment (for example, network architecture, bandwidth, data structures). To help with this, several pre-programmed profiles with different features are provided. Select from the pull-down menu. • **high quality (CIF)** 1 Mbps transmission rate for connections with high bandwidth • **high resolution (2CIF)** 1 Mbps transmission rate of high resolution for connections with high bandwidth • **small resolution (QCIF)** 9.6 Kbps transmission rate of low resolution for connections with high bandwidth • **DSL** 768 Kbps transmission rate for DSL connections • **ISDN (2B)** 128 Kbps transmission rate for ISDN connections over two B channels • **ISDN (1B)** 64 Kbps transmission rate for ISDN connections over one B channel • **MODEM** 33.6 Kbps transmission rate for analog modem connections • **GSM** 9.6 Kbps transmission rate for mobile communications (global standard)
Video on live page	MPEG2	Select **MPEG4** from the pull-down menu.

CONFIGURATION PAGE FOR VIDEO DECODER SETTINGS

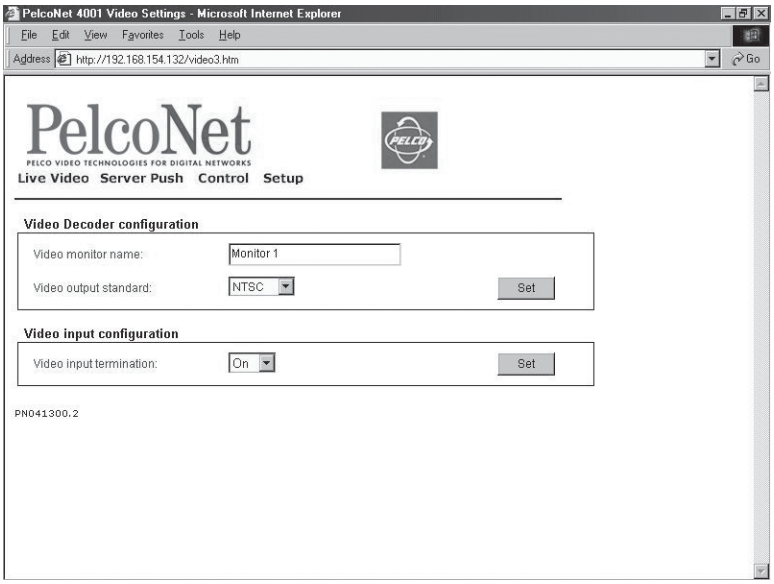


Figure 29. Configuration Page for Video Decoder Settings

Video monitor name, output standard, and input termination make up this page. The following table describes the configuration items.

Table D. Configuration Page for Video Decoder Settings

Configuration Item	Default Setting	Description
Video monitor name	Monitor 1	Enter an identifier for the monitor. (This name is not displayed except on this configuration page. For future development.)
Video output standard	PAL	For devices that also function as a receiver, select the video standard from the pull-down menu: **PAL** or **NTSC**.
Video input termination	On	Select **On** from the pull-down menu to terminate video input if the video signal will not be looped through (for example, with a T-connector).

CONFIGURATION PAGE FOR ALARM SETTINGS

The PelcoNet NET4001 transmission system is not only a multimedia gateway but also a security device and, therefore, has many features related to security applications. The configuration page for alarm settings lets you configure your unit for surveillance applications. In most surveillance-related applications, the receiver is located in a secure alarm center-type environment while the transmitter is mounted inside or at the location to be monitored.

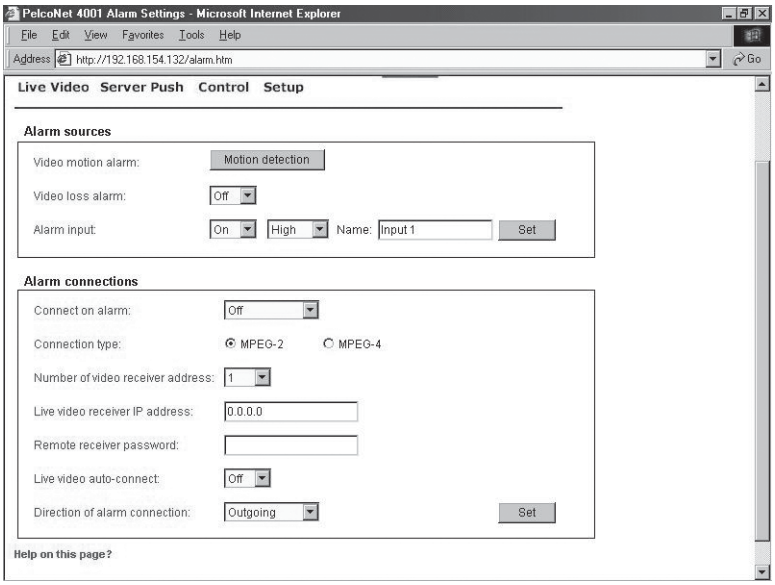


Figure 30. Configuration Page for Alarm Settings

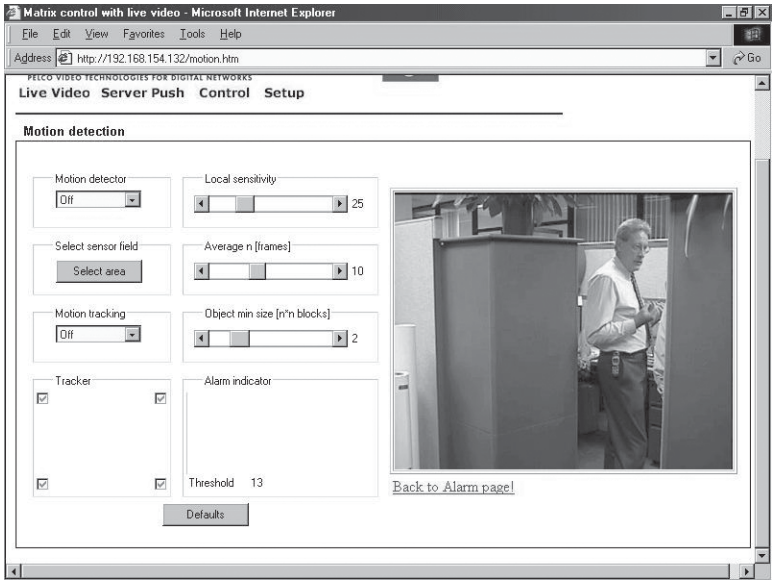


Figure 31. Motion Detection Screen

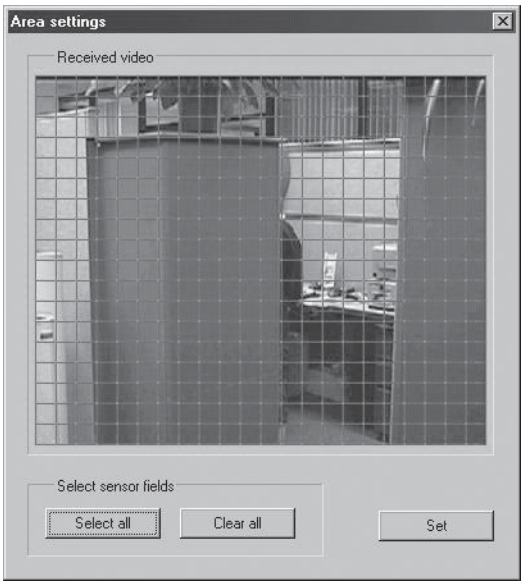


Figure 32. Motion Detection Grid Screen

The set of alarm features is explained below.

Table E. Alarm Settings

Configuration Item	Default Setting	Description
Video motion alarm	N/A	The system has a video motion detection feature. The video scene is monitored constantly for relevant motion. **NOTE:** Use of the motion detection feature is recommended only indoors and under controlled lighting conditions; it is not recommended in dim lighting. To set motion detection, do the following: 1. Click the **Motion detection** button to access the Motion Detection screen. (Refer to Figure 31.) Press **Default** to get the default settings for motion detection. If you want to customize the settings, continue to step 2. 2. Select **On** from the **Motion detector** pull-down menu to trigger an alarm in the event of movement. 3. Click the **Select area** button to display a window with a grid superimposed on it (refer to Figure 32). Select the cells in the image you want the system to monitor for motion. You can use the **Select all** and **Clear all** buttons. The default is all cells selected (red). To set an individual cell, click it with the left mouse button (it will turn red). Click with the right button to deselect a cell (which will turn white). Select or deselect multiple cells by holding down the left or right mouse button and dragging. Release when finished. Click the **Set** button. 4. Use the **Motion tracking** pull-down menu to turn on/off tracking. (Note that motion tracking overrides motion detection.) 5. The **Tracker** box indicates and controls the direction of motion detection. You can set motion detection to operate in one direction only by removing the check mark in the opposite direction. 6. Use the **Local sensitivity** slide bar to set detection sensitivity. You need to adapt sensitivity to the respective environment and the acceptable false alarm rate: for a lower false alarm rate select a lower sensitivity and vice versa. Experiment to find the best setting. 7. Use the **Average n [frames]** slide bar to define for how long or over how many pictures motion in the scene must be detected before an alarm will be released. If the value is low, even movement over a small period triggers an alarm. If the value is high, movement over a longer period is required to trigger an alarm.

(Continued on next page)

Table E. Alarm Settings (Continued)

Configuration Item	Default Setting	Description
		8. Use the **Object min size [nxn blocks]** slide bar to designate the minimum number of cells in the frame a moving object must fill to trigger an alarm. You can set the value between 1*1 and 6*6 (2*2 is recommended). If the size of the object in the picture exceeds the value you set, motion detection triggers an alarm. 9. The **Alarm indicator** box lets you set a threshold so an alarm is triggered only if the sensitivity of the video sensor is exceeded. Thus, something such as background noise caused by the camera can be filtered to avoid unwanted alarms. The blue line indicates the alarm threshold. Any value exceeding this produces an alarm signal. Components of the motion signal generating the alarm are indicated in red. Pull up or down on the blue line to observe the motion detector. Set it straight above the basic deviation of the red curve. 10. Click **Back to Alarm page!** when finished. The following conditions must be met for motion detection to function: • Motion detection must be activated. • At least one cell must be activated. • Sensitivity must be set higher than zero.
Video loss alarm	Off	If you select **On**, the signal from the video source (the camera in most cases) is monitored constantly for interruption. If no signal is received, the NET4001A triggers the alarm.
Alarm input	Off/High/ Input 1	1. Select **On** from the pull-down menu if you want to activate an alarm through an external alarm sensor. If not, select **Off**. 2. Select **High** or **Low** for the voltage level to activate the alarm. 3. Enter a name for the alarm input to be displayed on the screen if an alarm is activated.
Connect on alarm	Off	The alarm functions would have little effect without automatically triggering corresponding actions. Select **On** for automatic connection to the video receiver's IP address. The idea is to provide a remote monitoring station with live video in case of an alarm. This feature can be useful even for many applications not related to alarm conditions. One example is a video-equipped door entry system: when the doorbell is pressed, a contact closes and the connected transmitter automatically connects to a receiver. Full-duplex audio can provide verbal communication, while the relay output can open the door remotely.
Connection type	MPEG-2	Select the transmission standard for the alarm connection to the receiver's IP address.
Number of video receiver address	1	The NET4001A can store up to 10 different alarm IP addresses. When an alarm occurs, a connection will be established to the first address. Up to 10 separate addresses can be added should the first address not accept the call. Use the pull-down menu to select how many additional addresses to contact, if necessary. (Add them in the next field.)
Live video receiver IP address	0.0.0.0	Enter the IP address of the receiver to be notified in the event of an alarm.
Remote receiver password	N/A	Enter the password for the remote unit if it is protected by a user or live password.
Live video auto-connect	Off	Select **On** if at each restart an active connection should be set up automatically to the receiver's IP address. Otherwise, select **Off**. The auto connect feature guarantees an active connection to the receiver's alarm IP address even after connection breakdown or network failures. As soon as the network communications are restored, the connection is reinstated. On a receiver, this feature is enabled to establish a connection to a transmitter automatically.
Direction of alarm connection	Outgoing	Use the pull-down menu to select either **Incoming**, **Outgoing**, or **Bidirectional** depending on whether you want to receive (incoming), send (outgoing), or receive and send (bidirectional) video.

CONFIGURATION PAGE FOR RELAY SETTINGS

You can use the configuration page for relay settings to specify parameters such as normally open or normally closed switching and bistable or monostable operation of the output.

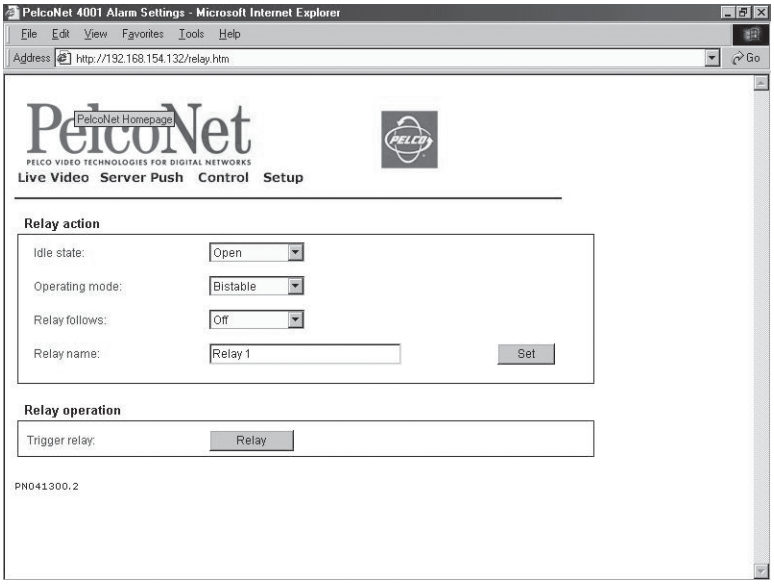


Figure 33. Configuration Page for Relay Settings

The relay settings are described in the following table.

Table F. Relay Settings

Configuration Item	Default Setting	Description
Idle state	Open	Select **Open** (N.O. at zero current) if the relay will operate as a normally open contact or **Closed** (N.C. at zero current) if it will operate as a normally closed contact.
Operating mode	Bistable	Select the relay's operating mode. • When you select the default **Bistable** mode, the relay will stay in the idle or active state for an indefinite period. (For example, select Bistable if a floodlight activated by an alarm is to remain switched on at the end of the alarm.) • When you select monostable mode, the relay automatically falls back to the idle state after a predefined period expires. (For example, select **10 s** if a siren triggered by an alarm is to sound for 10 seconds.) The choices on the pull-down menu are: Bistable, 0.5 s, 1 s, 2 s, 5 s, 10 s, and 60 s.
Relay follows	Off	Select from the pull-down menu an event that will activate the relay. A typical application is having the relay following the status of the alarm input; for example, to power peripheral equipment or even the camera itself. Select from the following: • **Off:** Relay does not operate. • **Connection:** Relay operates whenever you open live video and will turn off once you exit live video. • **Video alarm:** Relay operates when there is loss of the video signal. • **Motion alarm:** Relay operates when there is motion alarm. • **Local input:** Relay is operated by an external alarm sensor. • **Remote input:** Relay is operated by a switching contact from a remote location.
Relay name	Relay 1	Enter a name for the relay that will appear on the Live page.
Trigger relay	N/A	Click the **Relay** button to manually switch the relay (for example, as a test or to operate a door opener).

CONFIGURATION PAGE FOR COM 1 INTERFACE SETTINGS

You can use this configuration page to set the parameters of the COM1 RS-232/RS-485 serial interface port.

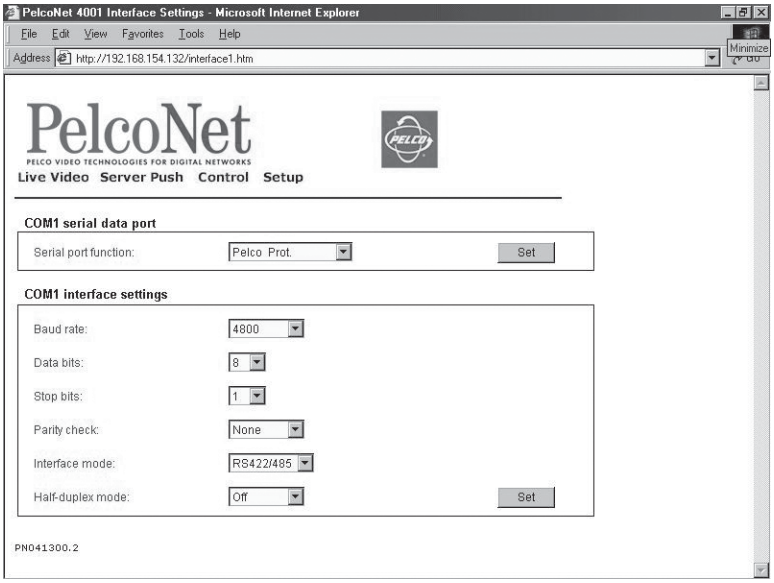


Figure 34. Configuration Page for COM 1 Interface Settings

Table G. Interface Settings for COM 1

Configuration Item	Default Setting	Description
Serial port function	Terminal	Select a controllable device from the pull-down menu: Terminal, Transparent, or Pelco Prot. (protocol). If the port must transmit data transparently, select **Transparent**.
Baud rate	19200	Select any transmission rate from 300 to 57600 baud.
Data bits	8	Select the number of data bits (7 or 8) per character.
Stop bits	1	Select the number of stop bits (1 or 2) per character.
Parity check	None	Select the type of parity check (None, Even, or Odd).
Interface mode	RS232	Select the required protocol for the port (RS232 or RS422/485).
Half-duplex mode	Off	If you choose this RS-232 mode, camera control data is transferred automatically to the control port, which is a serial interface on the unit's rear panel to which you can connect a PC. This mode supports flow control. **NOTE:** In **On** or **Buffered** mode, transparent data is rerouted to the control terminal port; terminal functions are provided on the transparent data port.

CONFIGURATION PAGE FOR COM 2 INTERFACE SETTINGS

You can use this configuration page to set the parameters of the COM2 RS-232/RS-485 serial interface port.

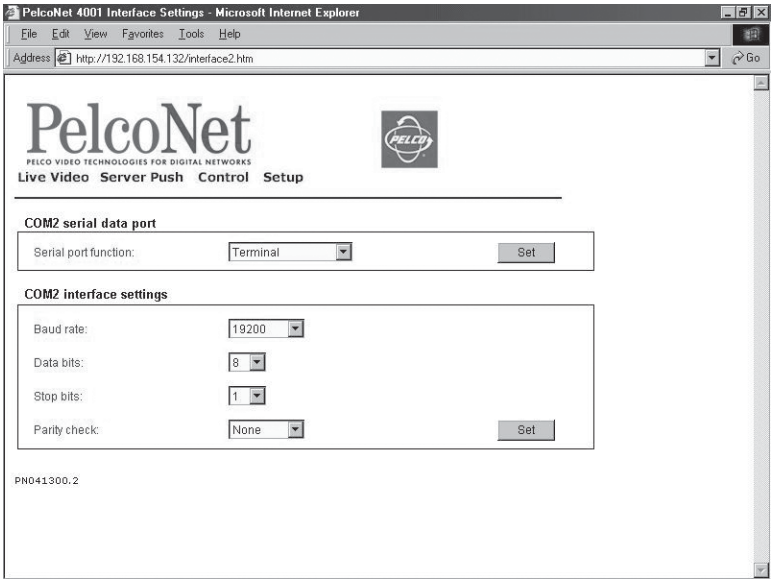


Figure 35. Configuration Page for COM 2 Interface Settings

Table H. Interface Settings for COM2

Configuration Item	Default Setting	Description
Serial port function	Transparent	Select the function for serial port 2 from the pull-down menu: Terminal, Transparent, or Pelco Prot. (protocol). If the unit will be operated from a terminal, select **Terminal**. If the port must transmit data transparently, select **Transparent**.
Baud rate	19200	Select any transmission rate from 300 to 57600 baud.
Data bits	8	Select the number of data bits (7 or 8) per character.
Stop bits	1	Select the number of stop bits (1 or 2) per character.
Parity check	None	Select the type of parity check (None, Even, or Odd).

CONFIGURATION PAGE FOR NETWORK SETTINGS

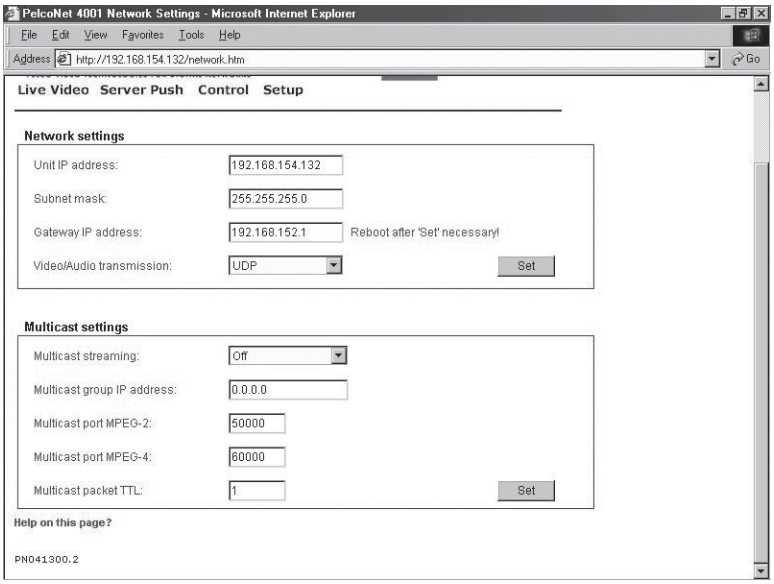


Figure 36. Configuration Page for Network Settings

Network and routing information make up the configuration page for network settings. These settings are used to integrate the NET4001A into an existing network. The following table describes the configuration items.

NOTE: When you change the IP address, subnet mask, or gateway IP address either through HyperTerminal or the browser, the system needs to be rebooted by cycling the power.

Table I. Network Settings

Configuration Item	Default Setting	Description
Unit IP address	192.168.0.1	Enter a unique IP address that is valid for your network. The pre-configured default IP address allows for easy configuration in closed environments. You can use a crossed cable to connect directly to a PC. **NOTE:** Changing the IP address also affects the current browser connection. You will have to enter the new URL to regain connectivity to the unit.
Subnet mask	255.255.255.0	Enter a valid subnet mask for your network.
Gateway IP address	0.0.0.0	Enter the IP address of the router if the unit is to establish a connection outside of the local network. This is typically used in a WAN environment. This field can otherwise remain empty (0.0.0.0).
Video/Audio transmission	UDP	Use the pull-down menu to select the means of transmission. Select **TCP (Port 80)** to send data through a firewall. Select **UDP** for communication between local networks.
Multicast streaming	Off	Use the pull-down menu to select multicast streaming mode. Besides a one-to-one connection between a transmitter and a receiver (unicast), the NET4001A lets you connect a number of receivers to receive the video signal simultaneously. This is achieved by distribution of a single data stream on the network itself to a number of receivers in a defined group (multicast). Choose one of the options. With one of the MPEG options selected and a valid multicast group address selected in the Multicast Group IP Address field, the NET4001A operates in multicast mode (data stream duplicated over the network). When multicast streaming is turned off, operation resorts to unicast mode.
Multicast group IP address	0.0.0.0	This is the Multicast IP address. (Network hardware—such as switches, hubs, routers, etc.—must support the multicasting protocol, ICMP.) This field sets PelcoNet to use the multicasting protocol, which allows more efficient use of bandwidth. The IP range is 224.0.1.0 through 238.255.255.255. Some IP addresses may be reserved for system resources. Contact your network administrator for more information.
Multicast port MPEG-2	50000	Enter the port address for the MPEG-2 data stream.
Multicast port MPEG-4	60000	Enter the port address for the MPEG-4 data stream.
Multicast packet TTL	1	Enter the number of seconds for the packet to live. TTL stands for time to live. This setting defines the lifetime of multicast packages in the network. If multicast traffic is to be transmitted over routers and switches this setting is important in adjusting the lifetime of the package to the network topology (shape).

LIVE VIDEO PAGE INDICATORS

These five indicators are located at the top of the Live Video and live video Control pages.

Indicator	Description
MPEG-2/MPEG-4	Indicates whether live viewing is in MPEG-2 or MPEG-4 format. You can assign this on the Video Encoder Settings page.
M (motion detector)	When motion alarm is triggered, this indicator turns red while the alarm is activated.
V (video alarm)	When the video loss alarm is triggered, this indicator turns red until the video returns.
I (input activation)	When triggered, this indicator turns red. The name assigned to this trigger and its duration and how it reacts can be assigned on the Alarm page.
R (relay activation)	When triggered, this indicator turns red. The name assigned to this trigger and how it reacts can be assigned on the Relay page.

LIVE VIDEO AND SERVER PUSH VIDEO PAGES

Figure 37. Live Video Page

The Live Video page shows a real-time picture of a camera view with update rates and image quality similar to a box-to-box configuration. It can be configured for bandwidth use and for various image quality settings. The Server Push page shows still pictures that are updated periodically, and image quality is fixed.

1. To access the PelcoNet NET4001 transmission system home page, you must first connect to the Internet/intranet network and open Internet Explorer (the browser).
2. Then, enter the default address **192.168.0.1** in the address box. If this address has been changed, enter the application address. The home page appears.
3. Click either **Live Video** or **Server Push** on the home page.

To exit either page, click an option at the top of the page.

The program displays dialog boxes when you try to view live video under any of the following conditions:

- With a browser other than Internet Explorer
- Without first installing ActiveX
- When your computer display is not set for 16- or 32-bit color

  To change: right-click the desktop, and then click **Properties**, the **Settings** tab, and select **High Color [16 bit]** or **True Color [32 bit]**. For NT, select **65536 Colors**.

  NOTE: Do not change the video properties while viewing live video. You may get a gray background if you do.

- When Microsoft Virtual Machine is not enabled

  To enable: on the Tools menu select **Internet Options**, select the **Advanced** tab, locate **Microsoft VM**, checkmark **Java Console Enabled** and **JIT compiler for virtual machine enabled**. Reboot your PC.

With any of these conditions, you can only view the video as a series of still images.

WEB BROWSER CONTROL PAGES

ACCESSING THESE PAGES

1. To access the PelcoNet NET4001 transmission system home page, you must first connect to the Internet/intranet network and open Internet Explorer (the browser).

2. Then, enter the default address **192.168.0.1** in the address box. If this address has been changed, enter the application address. The home page appears.

3. Click **Control** to access the Device Controls page.

4. The Device Controls page has underlined links to the control pages. To access, click one.

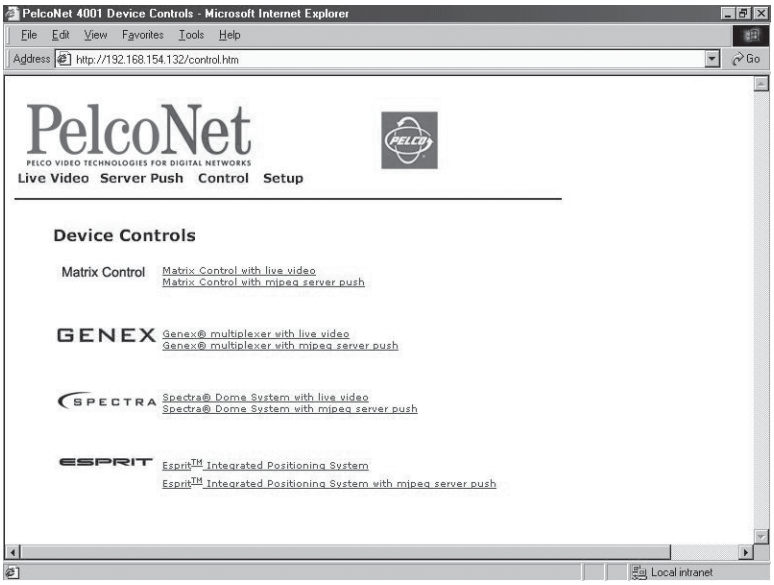

PelcoNet 4001 Device Controls - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.154.132/control.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Device Controls
Matrix Control
Matrix Control with live video
Matrix Control with mjpeg server push
GENEX
Genex® multiplexer with live video
Genex® multiplexer with mjpeg server push
SPECTRA
Spectra® Dome System with live video
Spectra® Dome System with mjpeg server push
ESPRIT
Esprit™ Integrated Positioning System
Esprit™ Integrated Positioning System with mjpeg server push
Local intranet

Figure 38. Device Controls Page

CONTROLLING THE DISPLAY

The live video control pages include representations of keys that let you control various functions (in addition to showing the camera display). Use the mouse pointer and click the left mouse button to enable options and operate controls on the screen. Click outside the options to disable a radio button or selection button.

Live video pages let you choose the size of the video viewing area. Click either **352x288** (small) or **704x576** (large) in the Resize Video field.

Live video pages also let you record and play back camera views on a PC's hard drive. Refer to the *Record and Play Back the Display on a PC* section for details.

On the Spectra and Esprit live video control pages, you can control the following:

- **Presets** –To program a preset: position the camera, click the **Set** check box, and then click a preset number button.

  To activate a preset: click a preset number button.

- **Patterns** – You can program only one pattern through PelcoNet. To program a pattern: click the **Set** check box, then click **Start**, and then use the arrow buttons to position the camera. Click **Stop** to halt pattern programming.

  To operate a pattern: click **Start** to begin the pattern and **Stop** to halt.

- **Programming Menus** – To access the programming menus: click the **Set** check box, and then click the **95** button. Use the open iris icon to open menus and set options. Use the open iris icon in conjunction with the **Exit** option to move backward through menu layers and to exit programming mode.

MATRIX CONTROL LIVE VIDEO/SERVER PUSH PAGE CONTENTS

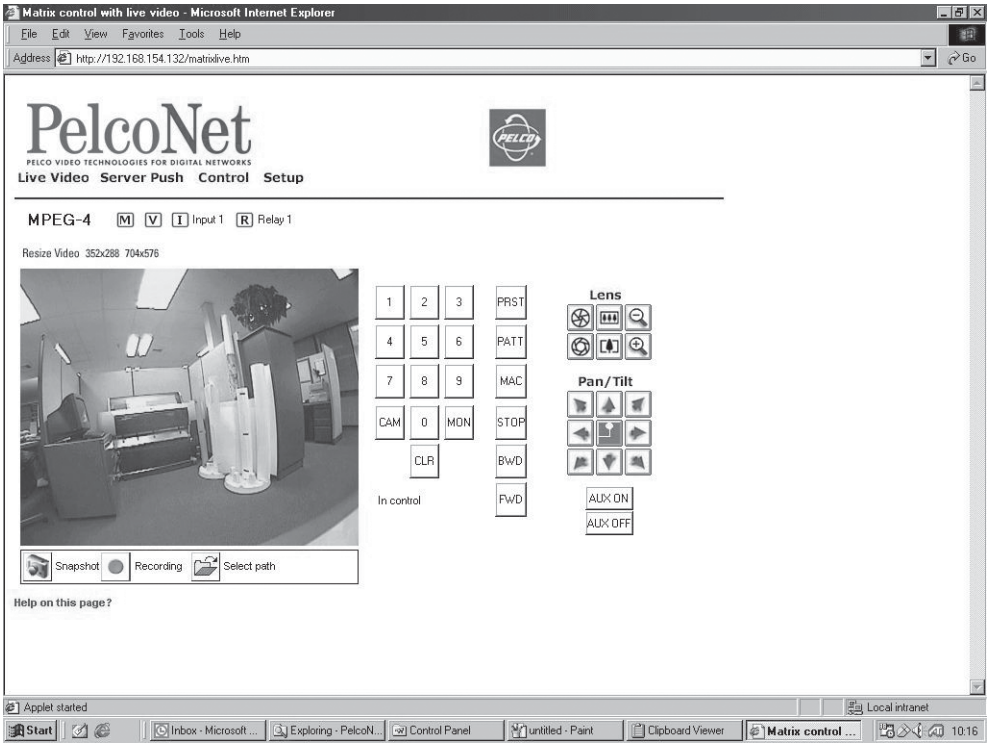


Figure 39. Matrix Control Page

The Matrix Control pages contain the following:

- Ten numbered buttons
- CLR (clear) button
- CAM (camera) button
- MON (monitor) button
- PRST (preset) button
- PATT (pattern) button
- MAC (macro) button
- STOP button
- BWD (backward) button
- FWD (forward) button
- AUX ON button
- AUX OFF button

The following are arrayed under “Lens ”:

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and zoom in buttons

The following are arrayed under “Pan/Tilt ”:

- Eight direction arrow buttons
- Home button in the center

Recording control buttons are beneath the picture.

GENEX LIVE VIDEO/SERVER PUSH PAGE CONTENTS

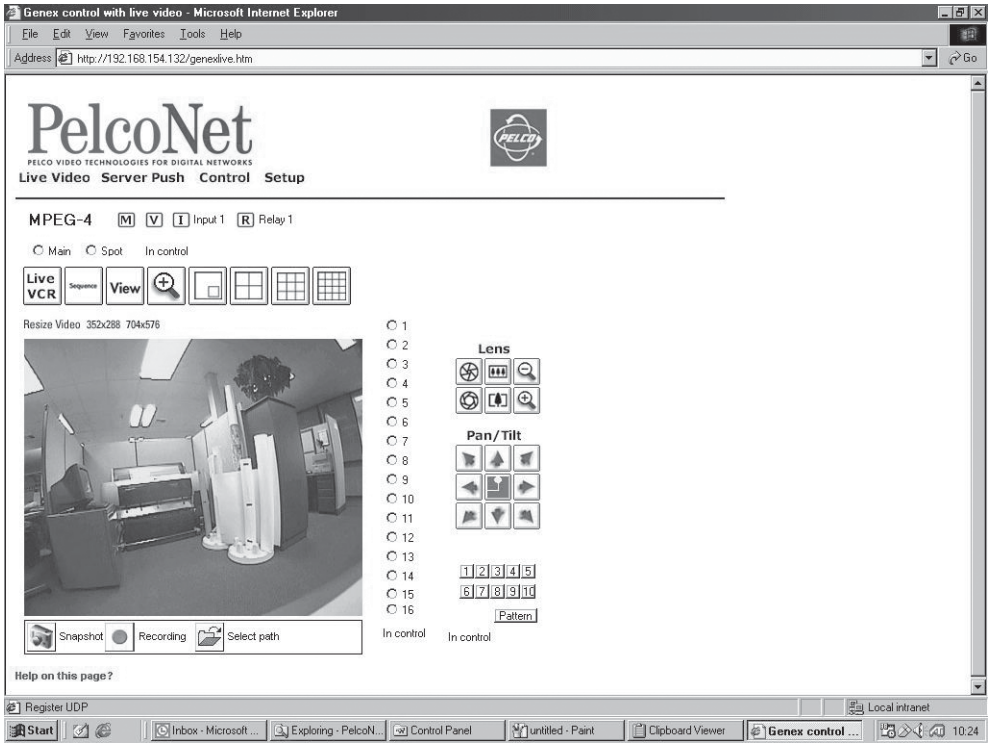


Figure 40. Genex Control Page

The Genex pages contain the following across the top of the page:

- Main and Spot monitor selection radio buttons
- A LIVE/VCR button
- A Sequence button
- A View button
- A zoom button
- A picture-in-picture button
- Buttons for 4-, 9-, and 16-screen display

The following are arrayed down the right side of the page:

- Radio buttons for 16 cameras
- Iris open and close buttons
- Focus far and near buttons
- Zoom out and in buttons
- Eight direction arrow buttons with a home button in the center
- Ten numbered buttons to use with the Pattern button (enter preset number and click **Pattern**)
- A Pattern button

Recording control buttons are beneath the picture.

SPECTRA LIVE VIDEO/SERVER PUSH PAGE CONTENTS

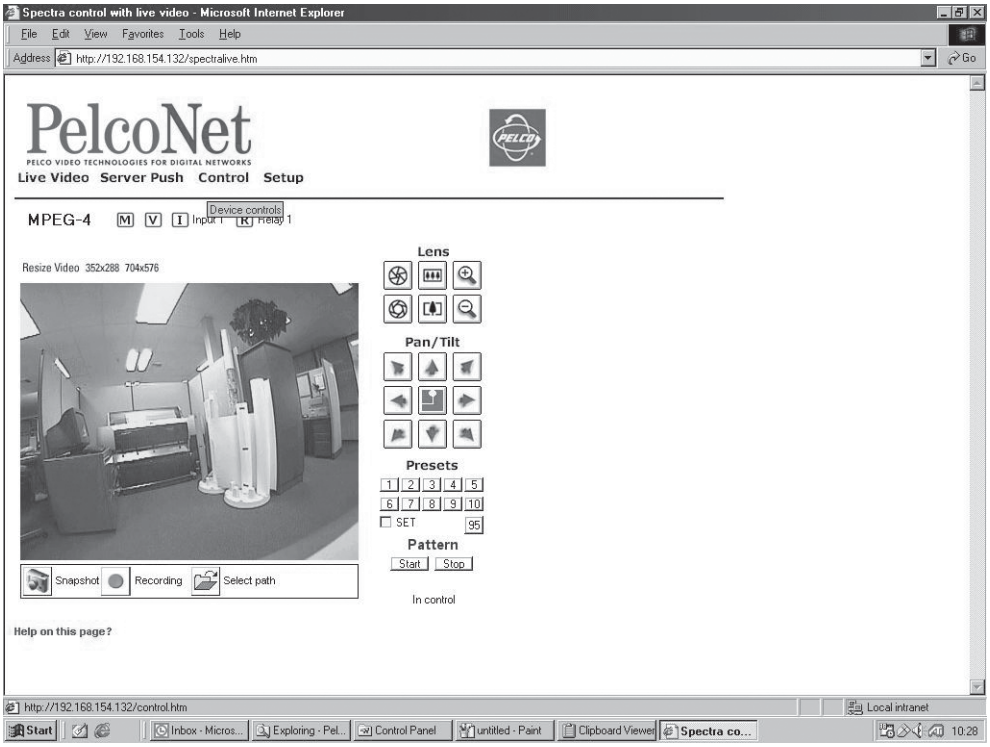


Figure 41. Spectra Control Page

The Spectra pages contain the following arrayed down the right side under "Lens":

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and in buttons

The following are arrayed under "Pan/Tilt":

- Eight direction arrow buttons
- Home button in the center

The following are arrayed under "Presets":

- Ten numbered preset buttons
- A SET check box
- A preset 95 button for entering the programming menus

The following are arrayed under "Pattern":

- A Start pattern button
- A Stop pattern button

Recording control buttons are beneath the picture.

ESPRIT LIVE VIDEO/SERVER PUSH PAGE CONTENTS

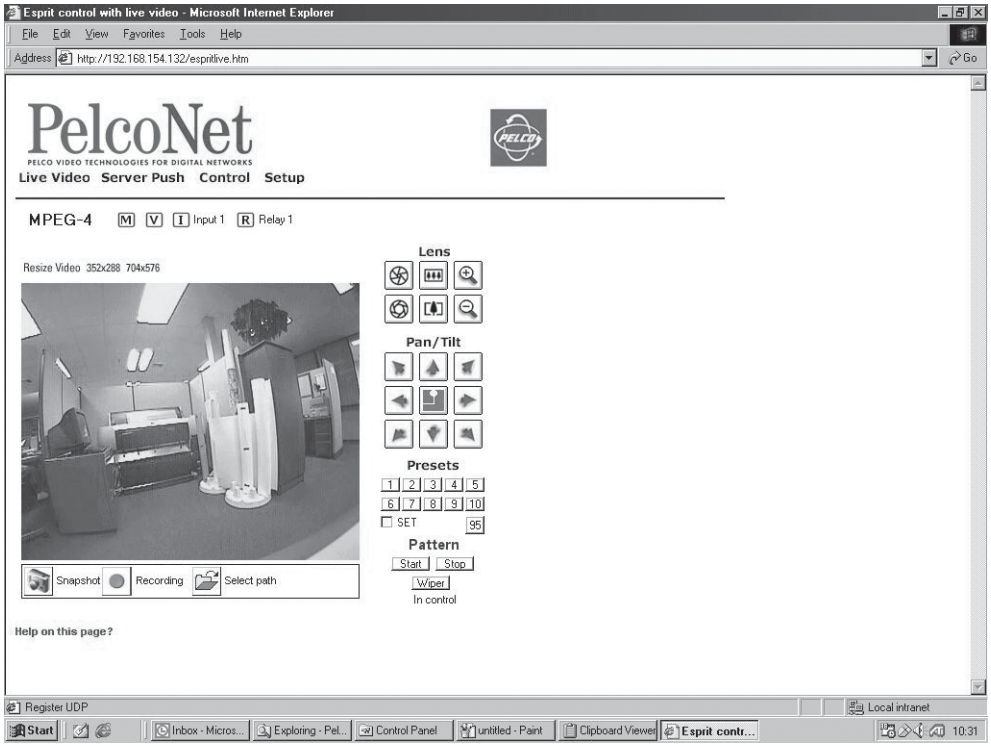


Figure 42. Esprit Control Page

The Esprit pages contain the following arrayed down the right side under "Lens":

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and in buttons

The following are arrayed under "Pan/Tilt":

- Eight direction arrow buttons
- Home button in the center

The following are arrayed under "Presets":

- Ten numbered preset buttons
- A SET check box
- A preset 95 button for entering the programming menus

The following are arrayed under "Pattern":

- A Start pattern button
- A Stop pattern button
- A Wiper button

Recording control buttons are beneath the picture.

ADVANCED FEATURES

AUTOMATIC CONNECTION FEATURE

The advantage of conventional dedicated cabling lies in guaranteed performance and availability. The PelcoNet transmission system's auto-connect feature is designed to provide the same level of guaranteed connectivity expected from analog coaxial video cables.

IT networks commonly experience short breakdowns and congestion. Protocols used for computer communication (for example, TCP/IP) are designed to cope with missing data and interruptions. With the PelcoNet NET4001A transmission system, once a video connection is established, the video stream normally terminates gracefully when a network connector is pulled or the network is otherwise disrupted.

The system can be configured to reconnect automatically to guarantee connectivity. To activate this feature, use the **Connect on alarm** pull-down menu to select **On** (on the Alarm Settings configuration page) and confirm this choice by clicking the **Set** button. Now the unit will try to connect to the specified alarm IP address every time. The receiving station (alarm IP address) can be another receiver.

VIDEO MOTION DETECTION FEATURE

The transmitter can check video input automatically for significant motion in the scene and trigger an alarm if the motion exceeds a preset threshold. Activate motion detection by clicking the **Motion detection** button on the Alarm Settings configuration page, and then use the **Motion detector** pull-down menu on the Motion Detection screen to select **On**.

Use the **Local sensitivity** sliding scale to select sensitivity for motion detection. You need to tailor this parameter to the particular application. Experiment to find the best setting. For example, higher sensitivity may lead to erroneous detection and increase false alarms.

You can restrict motion detection to certain areas in the scene. Click the **Select area** button. Select the cells you want the system to monitor for motion. To set an individual cell, click it with the left mouse button (which will turn red). Click with the right mouse button to deselect a cell (which will turn white).Select or deselect multiple cells by holding down the left or right mouse button and dragging. Release when finished, and then click the **Set** button.

RECORDING AND PLAYING BACK THE DISPLAY ON A PC

CHOOSING WHERE TO STORE THE FILE

The program automatically saves the snapshot (still picture) and video recording files at C:\ on the hard drive of the PC on which you are viewing the picture unless you tell it otherwise. If you want to store files in a different location on the PC, you need to first specify that location. To do so:

1. On the Home page, click either **Control** (and then click one of the underlined links to a live video control page) or **Live Video**.

2. Click the **Select path** icon (open folder) beneath the picture. (Click the icon just once. Double-clicking may cause display problems with the select path window.)

3. The program opens the "Path for saving MPEG/JPEG files" screen. Do not specify a file name (leave blank), just navigate to the location where you want the file stored and then click the **Save** button.

The file of any snapshot or video you record will be saved to that location.

RECORDING A SNAPSHOT

You can record a snapshot from the Live Video page or live video Matrix, Genex, Spectra, and Esprit control pages. The file is recorded on the PC on which you are viewing the picture. To do so:

1. On the Home page, click either **Control** (and then click one of the underlined links to a live video control page) or **Live Video**.

2. Position the camera as desired (if it has PTZ capability).

3. Click the **Snapshot** icon (camera) to record a still picture. The snapshot is saved on the PC's hard drive with a .jpg extension.

VIEWING A SNAPSHOT

You can view a snapshot by double-clicking on the desired file (.jpg extension) in Windows Explorer.

RECORDING THE VIDEO DISPLAY

You can record the camera display from the Live Video or live video Matrix, Genex, Spectra, and Esprit control pages. The file is recorded on the PC on which you are viewing the picture. To do so:

1. On the Home page, click either **Control** (and then click one of the underlined links to a live video control page) or **Live Video**.

2. Position the camera as desired (if it has PTZ capability).

3. Click the **MPEG Recording** icon (red dot button) to begin recording. The button flashes while recording is happening.

4. Click the **MPEG Recording** button again to stop recording. The recording is saved on the PC's hard drive with an .mp4 or .mp2 extension.

NOTE: When video files are saved, an extra file (.ind extension) is created that allows you to see the video in Pelco's MPEG Viewer. If you delete this file, you cannot view the saved .mp4 file although .mp2 files can still be viewed using the Windows Media Player.

VIEWING THE VIDEO DISPLAY

The video file is identified by date and time. MPEG-2 and MPEG-4 files are viewed differently.

- MPEG-2 Files

  View MPEG-2 files using the Windows Media Player. In Windows Explorer, double-click the file (.mp2 extension) you want to view. The player will load and play the file automatically.

- MPEG-4 Files

  View MPEG-4 files using the MPEGViewer program included on the PelcoNet Resource CD. Do the following:

1. Locate the **MPEGViewer.exe** file (either on the resource CD or the PC) or MPEG Viewer shortcut on the desktop if you used the installation program on the CD. Double-click the file. The viewer opens.

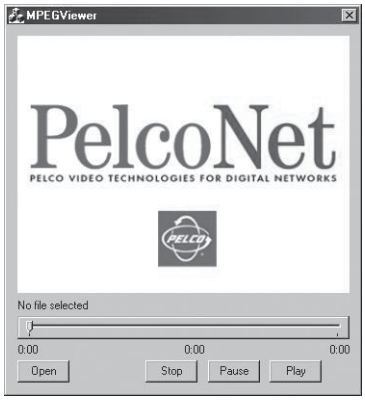


Figure 43. Viewer Screen

2. Click the **Open** button. A browse dialog box opens. Navigate to the recorded file (.mp4 extension) you want to view. Click the file to highlight it, and then click **Open**.

3. Click **Play** on the viewer to begin playback.

   The start and end locations are shown below the slide control. A counter marks your location in the file.

4. Use the **Pause** button to temporarily halt playback. You can change your location in the file by moving the pointer on the slide control. Click **Play** to resume playback.

5. Click **Stop** to halt playback.

FIRMWARE UPLOAD

Units have flash EPROMs for firmware upgrades in the field. These upgrades can be done directly from the web browser.

Do the following to upload firmware using the web browser.

1. Obtain the latest PelcoNet NET4001A transmission system firmware from Pelco (http://www.pelco.com).
2. Use the browser to select the General Settings configuration page of your unit.
3. Use the **Browse** button in the **Software upload** field to select the correct new firmware file.
4. Click the **Upload** button. The **Upload progress** field shows how the upload is proceeding.
5. After about 30 seconds you should get a feedback message from the connected unit.
6. The message "upload complete – WAIT" confirms the correct upload of the new firmware, which is now being installed.

   WARNING: Do not disconnect power to the unit for any reason while firmware is being installed. Disrupting the cycle will damage the flash EPROM. If this occurs, you will have to return the unit for repair.

   The unit automatically restarts when a successful upload is completed.

   However, if the LED **IN** flashes on conclusion, the upload has been unsuccessful and must be restarted. To do so: in the browser's address field behind the unit's IP address, enter **/main.htm**. For example, 192.168.0.12**/main.htm**. Restart the upload process.
7. If you try to upload an invalid firmware file, you will get the message "Upload Failed."
8. If you revisit the General Settings configuration page after the firmware is uploaded successfully, you will see the message "New Firmware Installed."

CONFIGURATION DOWNLOAD

This feature, located on the General Settings configuration page, lets you save the current configuration of the PelcoNet NET4001A transmission system to a PC file.

Do the following:

1. Use the browser to select the General Settings configuration page of your unit.
2. Click the **Download** button in the **Configuration download** field.
3. Save the file to the local hard drive. Use the default name and click the **Save** button. (Do not rename the configuration file when you save it; the NET4001A will not be able to upload the file later.)
4. Click the **Close** button.

You now have a configuration file to upload into a different PelcoNet unit.

CONFIGURATION UPLOAD

This feature copies a configuration file from a PC to the NET4001A.

Do the following:

1. Use the browser to select the General Settings configuration page of your unit.
2. Enter the name of the file containing the configuration, or locate it using the **Browse** button in the **Configuration upload** field.
3. Click the **Upload** button to overwrite the configuration with the configuration stored in the named file.
4. Wait for the General Settings page to refresh on its own. The configuration now matches that of the file created in the *Configuration Download* section.

TROUBLESHOOTING

If the following instructions fail to solve your problem, contact Pelco Technical Support at 1-800-289-9100 for help. You should have the serial number from the bottom of the unit and the firmware version ready in case they are needed.

Do not try to repair a unit yourself. Opening it immediately voids any warranty. Leave maintenance and repairs to qualified technical personnel. Swap a defective unit with a replacement unit and return the defective one for repair.

LEDS

The NET4001A has several LEDs that show the operating status and indicate possible faults:

LED	Indication	Meaning
VIDEO	Lit green	A video signal is present at the input.
IN	Flashing slowly	No valid firmware is installed; firmware upload is necessary.
	Lit green	Alarm input activated.
	Lit red	Alarm triggered.
	Not lit	Alarm input inactive.
OUT	Lit green	Relay activated.
	Not lit	Relay not activated.
COM	Flashing orange	Data transmission via serial interface.
ETHERNET	Lit green	Physical connection to the network is established.
	Flashing orange	Data transmission via the network.
POWER	Lit green	The unit is switched on but no connection.
	Flashing green	600 ms (50:50) = 1 active connection. 300 ms (50:50) = 2 active connection. 150 ms (50:50) = 3 or more connections.
	Flashing green	(50:650) = Streaming mode is active.
	Flashing green	70 ms (50:50) = External prompt.
	Not lit	The unit is switched off.

TERMINAL PROGRAM

- Is the right COM port interface on the PC selected for the terminal program, and are the settings correct? Is the cable connected to COM 1 and **not** COM 2 on the PelcoNet unit? Program default settings are 19200 kb/s, 8 data bits, no parity, 1 stop bit (8N1) for the terminal program.
- If the data exchange between the terminal program and the system still does not work, check the serial cable. Does the system answer when you press the Enter key?
- Disable the local echo if you see duplicate characters on your screen.

TROUBLESHOOTING A TCP/IP NETWORK USING A PING UTILITY

(Enter the appropriate information where indicated by the quotation marks below. Do not enter the quotation marks.)

To see if a unit in your network can be reached, try to ping your unit by typing the following command in a DOS window:

c:\ping 'unit IP address'

If it is reached, there will be a response like the following:

Reply from <IP address>: bytes=32 time=NN ms TTL=xxx

If the LAN path is malfunctioning, the ping command will time out. If so, you could have one of the following problems:

- Wrong physical connections. Make sure the green Ethernet LED is on.
- Wrong network connection. Verify the IP address is entered correctly and that subnet mask and gateway address are set properly.

Otherwise, ask your network administrator.

TROUBLESHOOTING CONNECTION PROBLEMS

If you fail to connect to a system from a hardware receiver, make sure network connectivity is available (for example, by using the ping command).

TROUBLESHOOTING THE VIDEO CONNECTION

If no video or a distorted video image is displayed at the receiver during a connection to a transmitter:

- Make sure the camera is switched on and the coaxial cable is connected to the NET4001A transmitter.
- Check the camera cable and connect a video monitor to the camera and check that the camera is functioning correctly.
- At the receiving system, make sure the monitor is switched on and the coaxial cable is connected to the NET4001A receiver.
- Check the monitor cable and the selection of the monitor channel, if the monitor features more than one video channel.
- If the monitor can display only a single video standard (PAL or NTSC), check the setting of the video output format on the Video Settings configuration page.

TESTING THE AUDIO CONNECTION

TEST BETWEEN TWO NET4001A UNITS

1. Connect a microphone (via a preamplifier) to the Audio In jack and a loudspeaker to the Audio Out jack on each NET4001A.
2. After establishing the Ethernet connection, audio should be transmitted both ways.
3. If you cannot hear any audio, check the microphone and loudspeaker together with other audio equipment, and make sure the microphone is switched on if it has a power switch.

TEST BETWEEN NET4001A AND PC

1. Connect a microphone (via a preamplifier) to the Audio In jack on the PelcoNet unit.
2. Connect a loudspeaker to the PC's sound card. After establishing the Ethernet connection, audio should be transmitted from the PelcoNet unit to the PC.
3. If you cannot hear any audio, check the microphone and loudspeaker together with other audio equipment, and make sure the microphone is switched on if it has a power switch.

GENERAL REMEDIES TABLE

Problem	Possible Causes	Suggested Remedy
No connection between unit and terminal program.	Faulty cable connections.	Check all leads, plugs, contacts, and connections.
	The computer's serial interface is not connected.	Check other serial interfaces.
	Interface parameters do not match.	If necessary, select a different COM port, make sure the computer's interface parameters match with those of the unit. Possibly select the following standard parameters: 19200 baud, 8 data bits, no parity, 1 stop bit. Then turn off power to the unit and turn on again after a few seconds.
No picture transmission to remote station.	Defective camera.	Connect local monitor and check camera function.
	Faulty cable connection.	Check all leads, plugs, contacts, and connections.
No connection established, no picture transmission.	Configuration of the unit.	Check all configuration parameters.
	Faulty installation.	Check all leads, plugs, contacts, and connections.
	Wrong IP address.	Check IP address (terminal program).
	Faulty data transmission within LAN.	Check data transmission with the ping command.
	The maximum number of receivers is connected.	Wait until a new connection is possible and dial again.
No audio transmission to receiver.	Defective hardware.	Check perfect functioning of all audio devices connected.
	Faulty cable connection.	Check all leads, plugs, contacts, and connections.
	Audio voice connection is occupied by another receiver.	Wait until the connection is free and dial again.
Cannot control PTZ cameras or other devices.	Cable connection between the RS-232 interfaces and the connected device is incorrect.	Check all cable connections and ensure all plugs are properly plugged in.
	The interface parameters conflict with the other connected devices.	Make sure the settings of the devices involved agree with each other.
The unit is not ready for operation after firmware upload.	Voltage failure while the update file is being programmed.	Replace the device and have it checked by Pelco.

SPECIFICATIONS

NETWORK PROTOCOL AND STANDARDS COMPATIBILITY

Internet Configuration:	RTP, RTCP, UDP, TCP, IP, HTTP, SNMP, IGMP, ICMP, ARP, DHCP
Video Coding:	MPEG-1, MPEG-2, MPEG-4, (M-JPEG in Server Push mode only)
Video Frame Rate:	Up to 30 images/second

INTERFACE

Video Input:	1 BNC, PAL/NTSC, 75 ohms, 1 Vp-p
Video Output:	1 BNC, PAL/NTSC, 75 ohms, 1 Vp-p
Audio Input:	3.5 mm stereo jack, 3 Vp-p, approximately 50 kohms
Audio Output:	3.5 mm stereo jack, 2.5 Vp-p, 60 mW, minimum 8 ohms
LAN Interface:	UTP (Ethernet 10/100BASE-T auto-sensing), RJ-45
LAN Data Rate	
MPEG-2:	1 Mbps to 6 Mbps
MPEG-4:	9.6 Kbps to 1.5 Mbps
Data Interface:	1 RS-232/RS-422/RS-485, bi-directional (9-pin, D-sub)
Alarm Input:	1 terminal for direct connection of control, maximum 40V, 0.8A
Alarm Output:	1 terminal for relay

VIDEO

Video Standards:	PAL, NTSC
Video Image Size	
PAL:	704 x 576 pixels (high resolution)
	352 x 288 pixels (CIF)
NTSC:	704 x 480 pixels (high resolution)
	352 x 240pixels (CIF)

POWER

Cable Type:	1 USA standard and 1 European standard
Operating voltage:	90-250 VAC, 50/60 Hz

MISCELLANEOUS

LED Displays:	9 LEDs (video, in, out, Ethernet, IR, HDD, COM, power)

ENVIRONMENTAL

Operating Temperature:	32° to 122°F (0° to 50°C)
Operating Humidity:	80% maximum relative humidity, non-condensing
Storage Temperature:	-4° to 140°F (-20° to 60°C)
Storage Humidity:	95% maximum relative humidity, non-condensing

GENERAL

Dimensions:	8.1 (W) x 1.7 (H) x 11.9 (D) inches (20.5 x 4.4 x 30.1 cm)
Unit Weight:	Approx. 4.4 lb (2.0 kg)
Shipping Weight:	Approx. 7.3 lb (3.3 kg)

CERTIFICATIONS

- CE, Class B
- cTUVus
- FCC, Class B

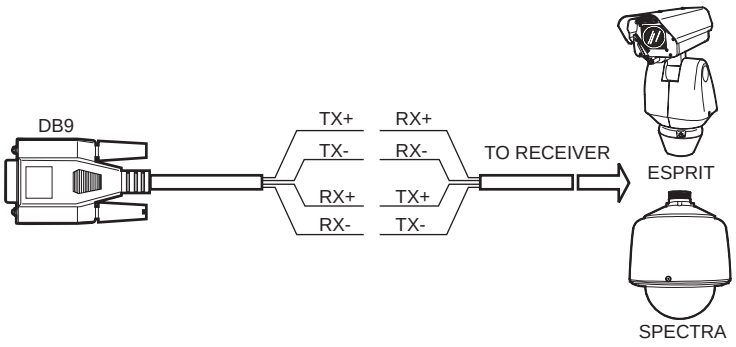
GLOSSARY

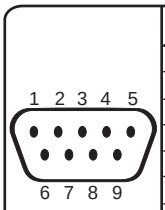
10BASE-T	IEEE 802.3 specification for 10 or 100 Mbs Ethernet
ARP	Address Resolution Protocol
Baud rate	Data transmission rate
bps	Bits per second, the actual data rate
Cat5 Cable	Type of cable used on a LAN to connect computers, printers, and transmitters and receivers to a hub on the network
CIF	Common Intermediate Format; video format with 352 x 288 pixels
Default Gateway	The router's IP address (for example, 192.168.0.1)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
FTP	File Transfer Protocol
Full duplex	Simultaneous data transmission in both directions
G.711, G.728	Standard audio coding algorithms defined by ITU-T
H.224	Standard protocol for data communication and remote control
H.261	Standard motion video coding algorithm defined by ITU-T
H.323	Standard for M-JPEG video and audio compression defined by ITU-T
HTTP	Hypertext Transfer Protocol
HTML	Hypertext Markup Language
Hub	A device on the network that connects multiple computers together to form a LAN
ICMP	Internet Control Message Protocol
ID	Identification: machine-readable number or name
IGMP	Internet Group Management Protocol
IEEE	Institute of Electrical and Electronics Engineers
Internet Protocol	The main protocol used on the Internet. Forms—in conjunction with the Transfer Control Protocol (TCP)—the TCP/IP protocol suite
IP	See Internet Protocol
IP Address	A unique four-byte number that identifies each unit on the Internet or network. Usually written in dotted decimal notation with periods separating the bytes. This address is required to communicate on the network (for example, 192.168.0.100).
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
JPEG	Joint Photographic Expert Group (procedure to encode still images)
Kbps	Kilobits per second; the actual data rate

LAN	See Local Area Network
Local Area Network	Multiple computers linked together into a network to share information within a limited geographic area (such as a building or a campus) controlled by a network operating system and using a transport protocol
MAC Address	Media Access Control/hardware address
Mbps	Megabits per second; the actual data rate
MPEG-1	Video compression standard, initially hardware-independent, now also possible with software
MPEG-2	Enhanced video compression standard, high-level compression facilitates images with studio quality, meanwhile established as broadcasting standard
MPEG-4	Further development of MPEG-2, used for transmission of audiovisual data with very low transfer rates (for example, via Internet)
NAT	See Network Address Translator
Network Address Translator	A proposal for IP address re-use where the local IP address is mapped to a globally unique address
Parameter	Values used for the configuration of the network system
Picture	A video picture that has been digitized at a particular resolution
PPP	See Point-To-Point Protocol
Point-To-Point Protocol	A protocol allowing a computer using TCP/IP to connect directly to the Internet
Router	A physical device that connects multiple LANs
QCIF	Quarter CIF, video format with 176 x 144 pixels
Server Push	A continuous stream sent from the transmitter to the web browser
Subnet Mask	A mask that explains which part of an IP address is the network address and which part composes the host address. It is usually expressed in dotted-decimal notation (for example, 255.255.255.192).
TCP	Transfer Control Protocol
UDP	User Datagram Protocol
URL	Uniform Resource Locator
UTP	Unshielded Twisted Pair
WAN	See Wide Area Network
Wide Area Network	Multiple LANs connected together, usually over a great distance

APPENDIX A – CONNECTING PELCONET NET4001A TO VARIOUS COMPONENTS

Some of the connection examples that follow require the customer to supply a DB9 cable. Refer to the following figure when one is needed.





PIN	RS-232	RS-422/RS-485
1	DCD (DATA CARRIER DETECT)	
2	RXD (RECEIVE DATA)	RXD- (RECEIVE DATA MINUS)
3	TXD (TRANSMIT DATA)	TXD- (TRANSMIT DATA MINUS)
4	DTR (DATA TERMINAL READY)	
5	GND (GROUND)	GND
6	DSR (DATA SET READY)	
7	RTS (READY TO SEND)	TXD+ (TRANSMIT DATA PLUS)
8	CTS (CLEAR TO SEND)	RXD+ (RECEIVE DATA PLUS)
9		

Figure 44. DB9 Cable Wire Splicing

CONNECTING PELCONET TO VARIOUS COMPONENTS WITH ASSORTED KEYBOARDS

CONNECTION SCENARIO 1 – USING A KBD300A IN DIRECT MODE

Refer to Figure 45 and the instructions that follow.

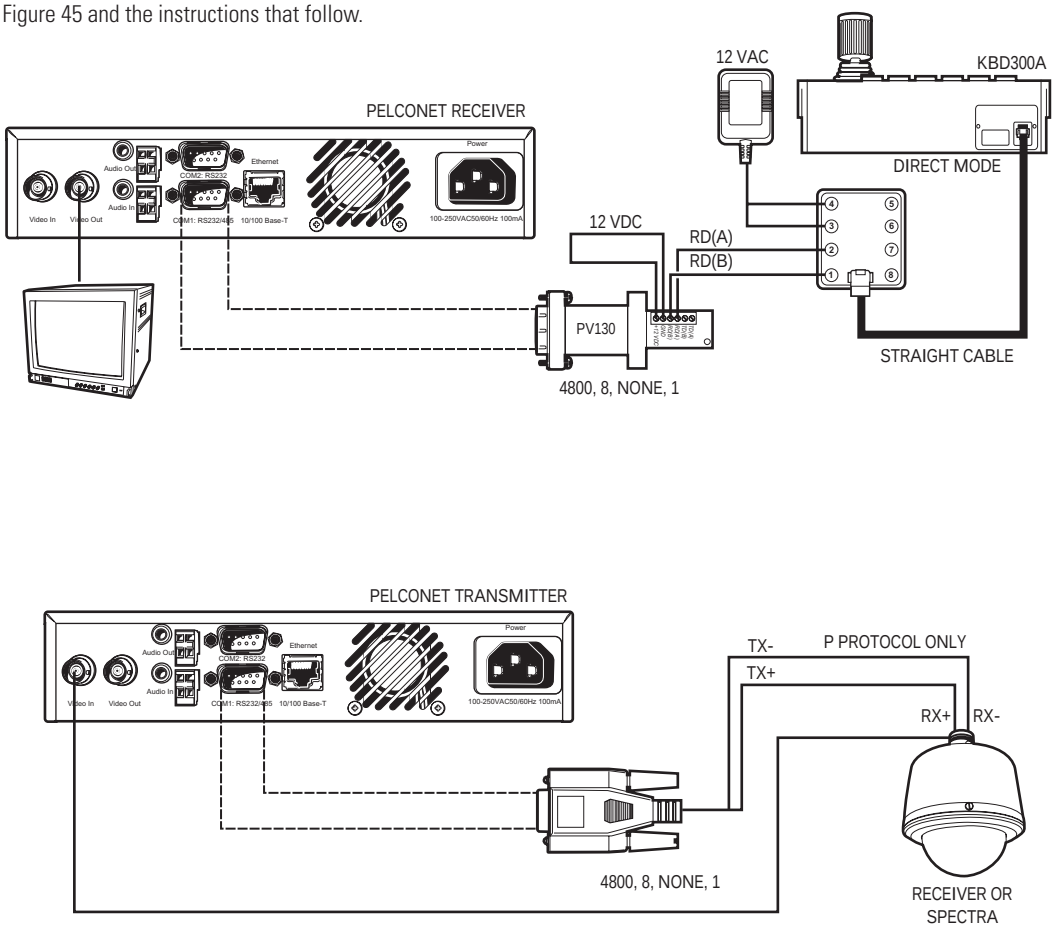


Figure 45. KBD300A (Direct Mode) Connected to a Receiver or Spectra Dome System

1. Connect a PV130 converter to the COM1 port on the back of the NET4001A receiver unit. (In Interface Mode select RS232.) The data format should be 4800 baud, 8 data bits, no parity, and 1 stop bit.
2. Connect the black and white striped wire from the power supply that comes with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.
3. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.
4. Connect a 12 VAC power supply to terminals 3 and 4 on the wall block.
5. Set DIP switch 6 on the KBD300A to ON to enable turbo pan operation or OFF to disable that feature. The KBD300A will recognize Direct Mode automatically.
6. Connect the wall block to the KBD300A with an RJ-45 straight cable.
7. Connect the monitor.
8. Refer to Figure 44 and Figure 45. Splice the customer-supplied DB9 cable into the Spectra/Esprit or receiver cable. Use P protocol only.
9. Plug the DB9 cable into the COM1 port on the transmitter. (For Interface Mode select RS422/485.) The data format should be 4800, 8, no parity, 1.
10. Connect the camera's video to the transmitter.

CONNECTION SCENARIO 2 – USING A KBD4000 FOR MULTIPLEXER CONTROL

Refer to Figure 46 and the instructions that follow.

NOTE: If you set all your cameras to Standard Coaxitron for better control on the browser, you will lose most of the KBD4000 keyboard control functions. If you set your cameras to Extended Coaxitron, you will have all the keyboard functions but the PTZ functions on the NET4001A will be very slow.

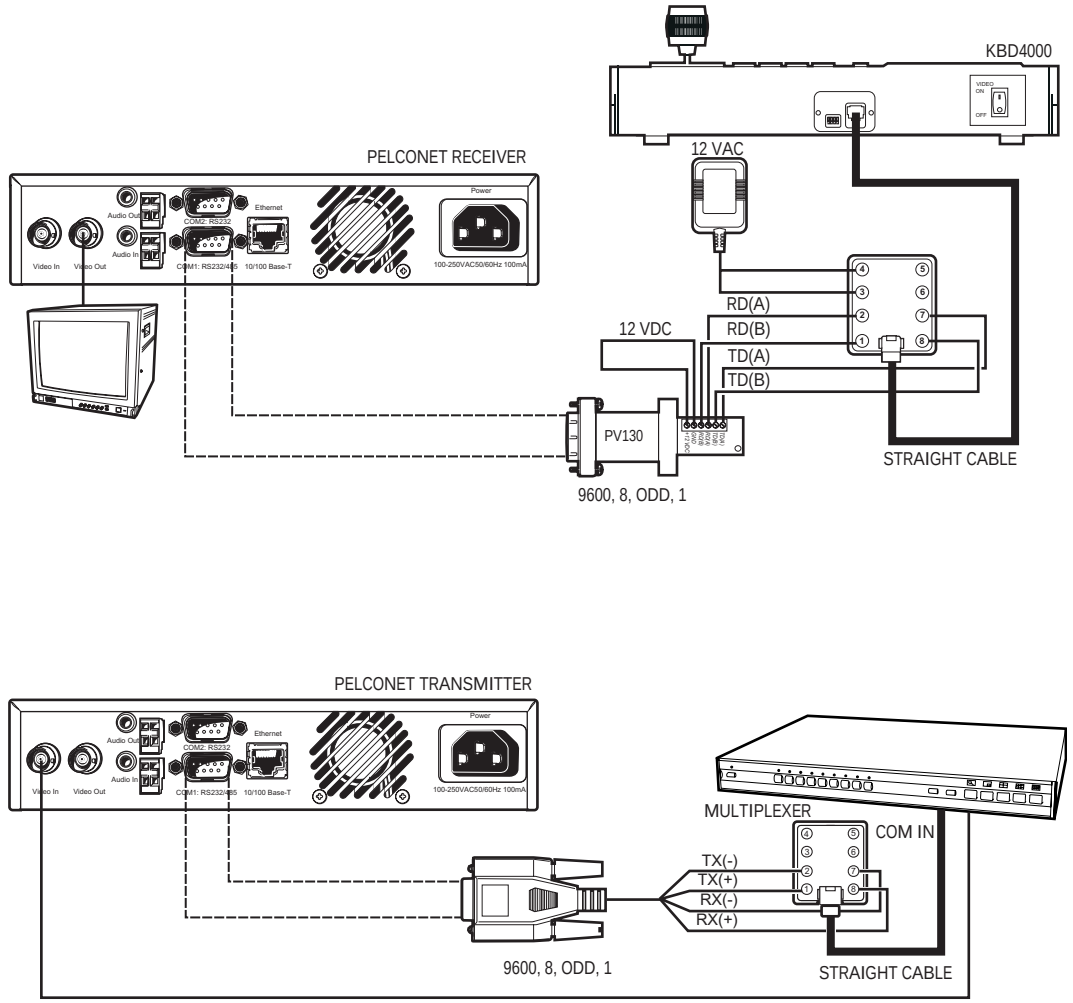


Figure 46. KBD4000 Connected to a Multiplexer

1. Connect a PV130 converter to the COM1 port on the back of the NET4001A receiver unit. (For Interface Mode select RS232.) The data format must be 9600 baud, 8 data bits, odd parity, and 1 stop bit.
2. Connect the black and white striped wire from the power supply that comes with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.
3. Connect TD(A) on the converter to terminal 7 on the wall block. Connect TD(B) on the converter to terminal 8 on the wall block. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.
4. Connect a 12 VAC power supply to terminals 3 and 4 on the wall block.
5. Connect the wall block to the KBD4000 with an RJ-45 straight cable.
6. Connect the monitor.
7. Refer to Figure 44 and Figure 46. Splice the customer-supplied DB9 cable into the multiplexer wall block. Connect TX- from the NET4001A to terminal 2 on the wall block, TX+ to terminal 1, RX- to terminal 7, and RX+ to terminal 8.
8. Plug the DB9 cable into the COM1 port on the transmitter. (For Interface Mode select RS422/485.) The data format must be 9600, 8, odd, 1.
9. Connect the wall block to COM IN on the multiplexer with an RJ-45 straight cable.
10. Connect MAIN video output from the multiplexer to the transmitter.

CONNECTION SCENARIO 3 – USING A CM9760-KBD

Refer to Figure 47 and the instructions that follow.

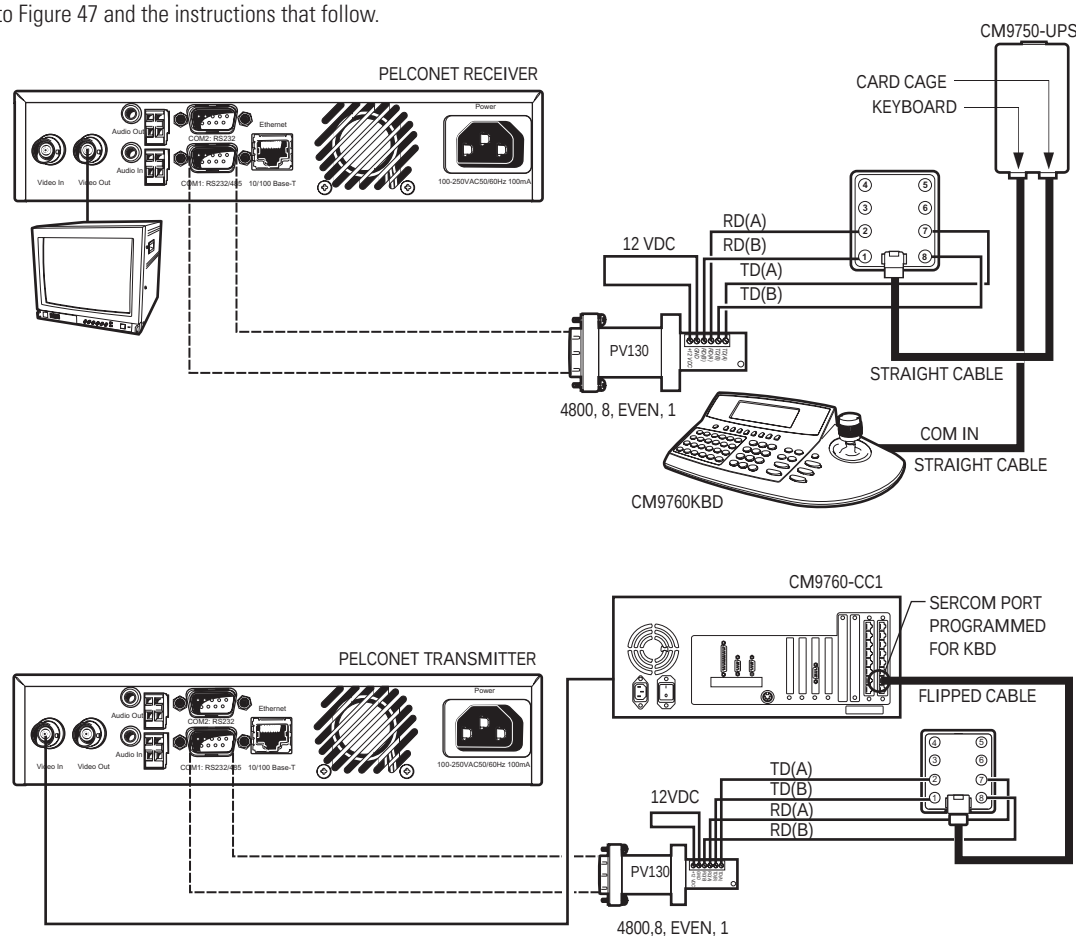


Figure 47. CM9760KBD Connected to a CM9760-CC1 Controller

1. Connect a PV130 converter to the COM1 port on the back of the NET4001A receiver unit. (For Interface Mode select RS232.) The data format must be 4800 baud, 8 data bits, even parity, and 1 stop bit.

2. Connect the black and white striped wire from the power supply that comes with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.

3. Connect TD(A) on the converter to terminal 7 on the wall block. Connect TD(B) on the converter to terminal 8 on the wall block. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.

4. Connect an RJ-45 straight cable from the wall block to the power pack.

5. Connect an RJ-45 straight cable from the keyboard input connector on the power pack to COM 1 on the keyboard.

6. Connect the monitor.

7. Refer to Figure 44 and Figure 47. Splice the customer-supplied DB9 cable into the CM9760-CC1 wall block. Connect TX- from the NET4001A to terminal 2 on the wall block, TX+ to terminal 1, RX- to terminal 7, and RX+ to terminal 8.

8. Plug the DB9 cable into the COM1 port on the transmitter unit. (For Interface Mode select RS232.) The data format must be 4800, 8, even, 1.

9. Connect an RJ-45 flipped cable from the wall block to Sercom port 5 on the CC1's rear panel.

10. Connect one of the three monitor outputs on the rear of the controller to the transmitter unit.

CONNECTING PELCONET TO THE COM IN RS-422 PORT ON A GENEX MULTIPLEXER

Refer to Figure 48 and the instructions to follow.

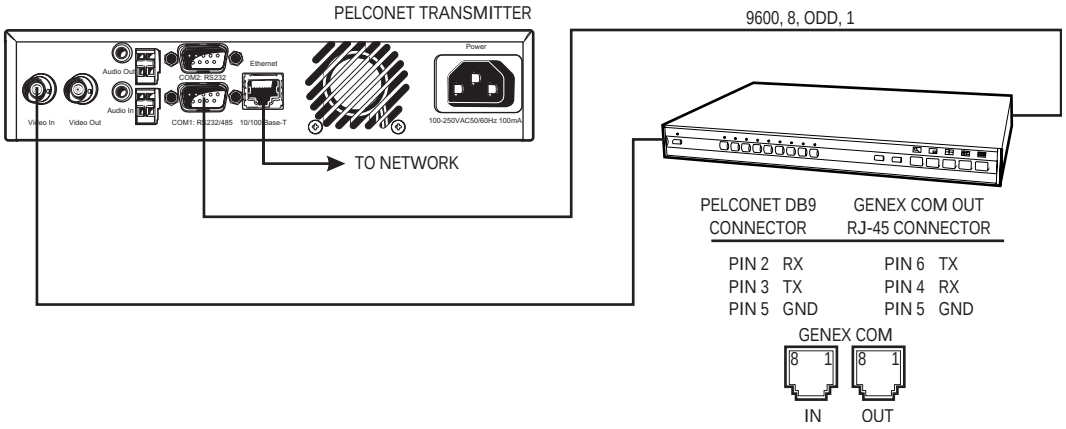


Figure 48. Connecting PelcoNet to Genex Using the COM IN RS-422 Port

1. Verify that the multiplexer has Version 4.1 firmware. (The version number flashes on the monitor when power is applied to the multiplexer.)

2. Set the NET4001A COM1 data port to **Transparent, 9600 baud, 8 data bits, odd** (for parity), **1 stop bit**, and **off** if it is not so set already. (For Interface Mode select RS232.)

3. Create a cable using the diagram in Figure 44.

4. Attach the cable's DB9 connector end to PelcoNet's COM 1 port. Connect the cable's RJ-45 connector end to COM IN on the back of the multiplexer.

5. Connect the MAIN video output from the multiplexer to the NET4001A transmitter.

6. Connect PelcoNet's Ethernet port to the network using a Cat5 Ethernet patch cable.

CONNECTING A PELCONET RECEIVER TO A SYSTEM CM9502

Refer to Figure 49. This configuration lets an operator view and control cameras with a CM9505 keyboard.

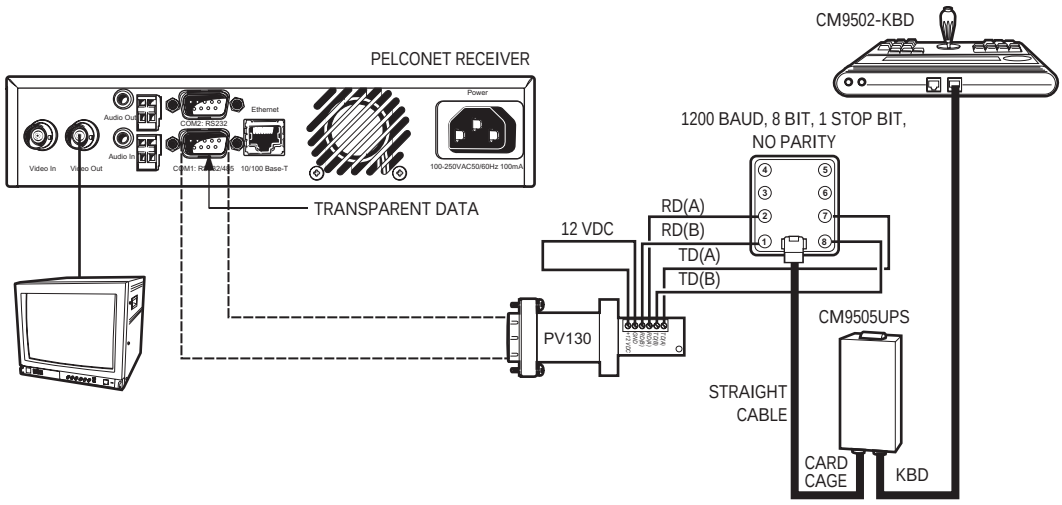


Figure 49. Using PelcoNet with CM9505 to Provide Remote Control

CONNECTING PELCONET TO A CM9502 ASCII SERIAL PORT

Refer to Figure 44 and Figure 50. This configuration lets an operator view and control cameras from a PC using a web browser. (The operator's PC is not shown on the diagram.)

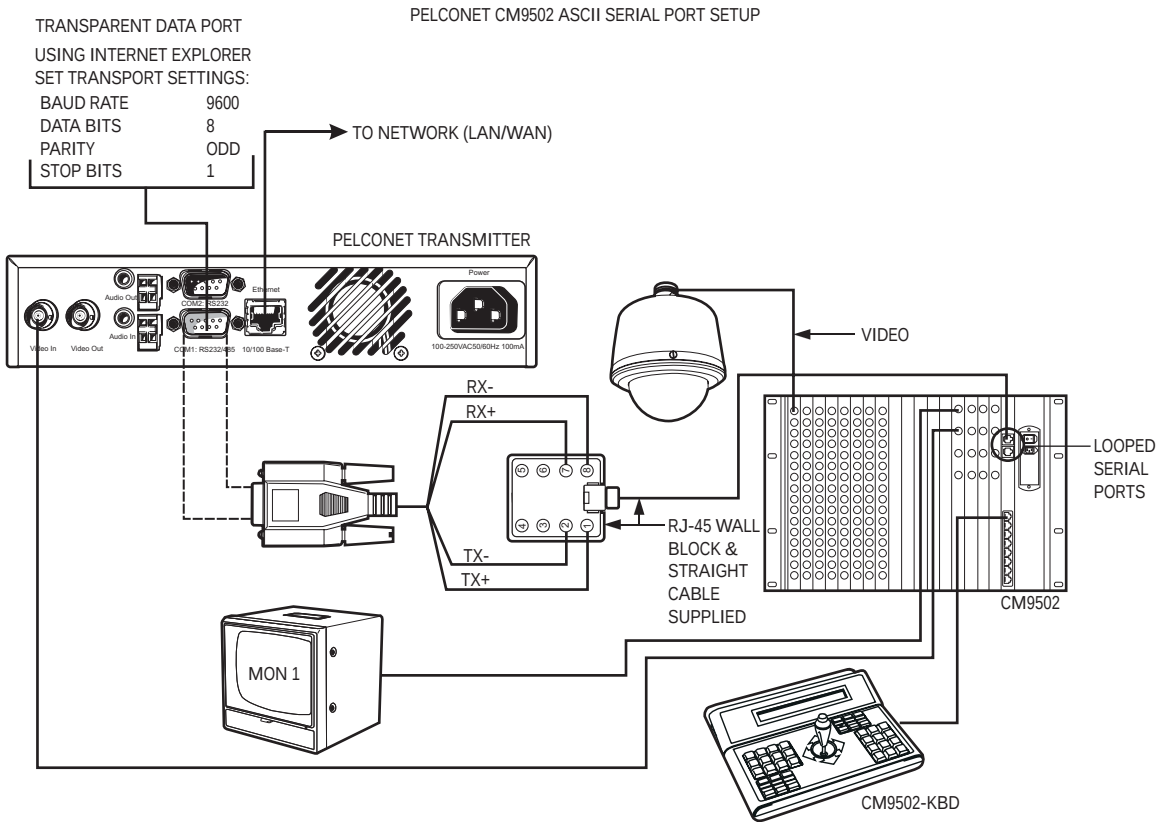


Figure 50. Using PelcoNet with CM9502 to Provide Remote Control

CONNECTING PELCONET TO A CM6700 AND KBD200A FOR REMOTE ASCII CONTROL

Refer to Figure 51. This configuration lets an operator view and control cameras with a remote KBD200A keyboard.

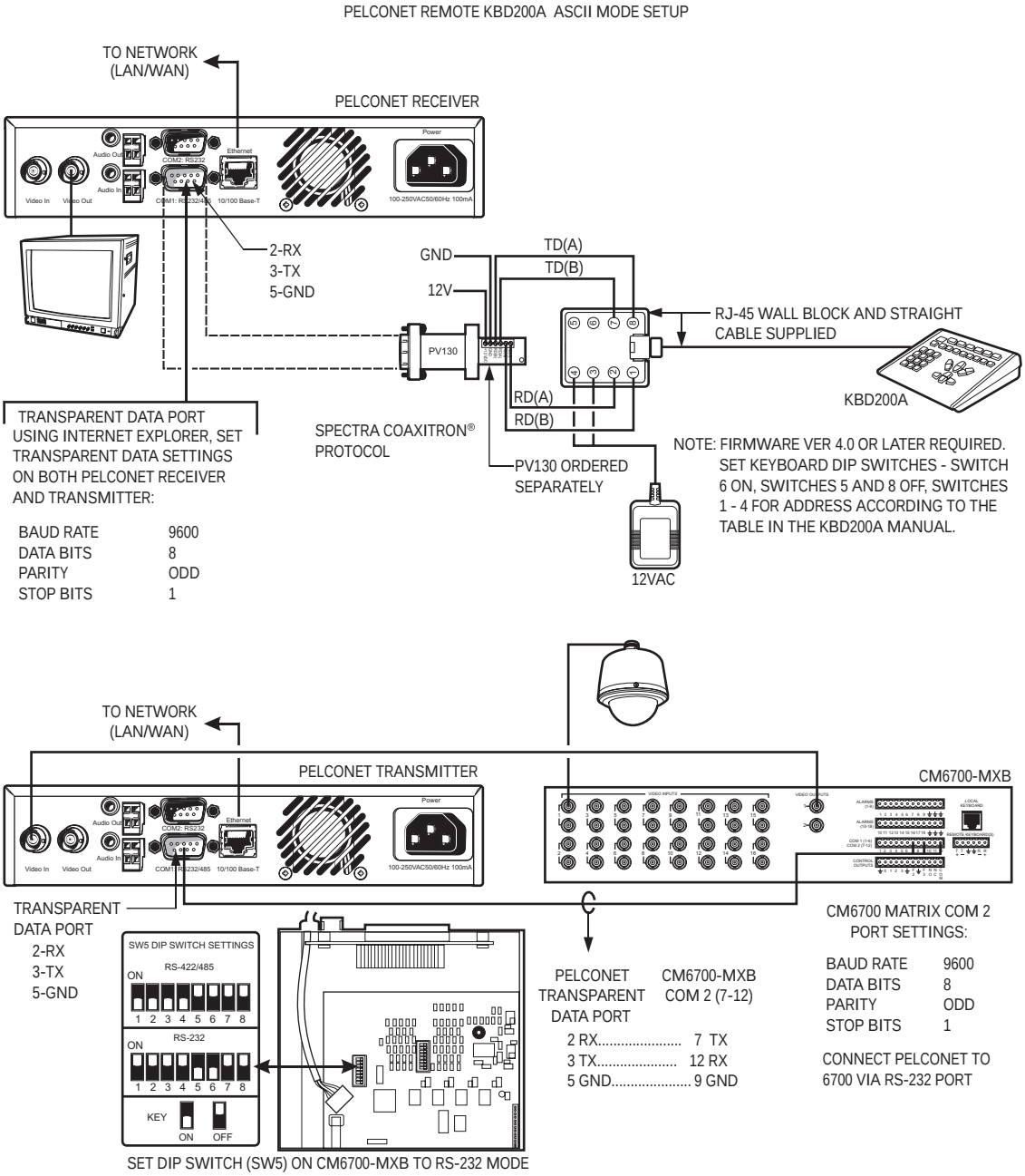


Figure 51. Using PelcoNet with CM6700 and KBD200A to Provide Remote Control

CONNECTING PELCONET TO A CM6700 ASCII PORT

Refer to Figure 52. This configuration lets an operator view and control cameras from a PC using a web browser. (The operator's PC is not shown on the diagram.)

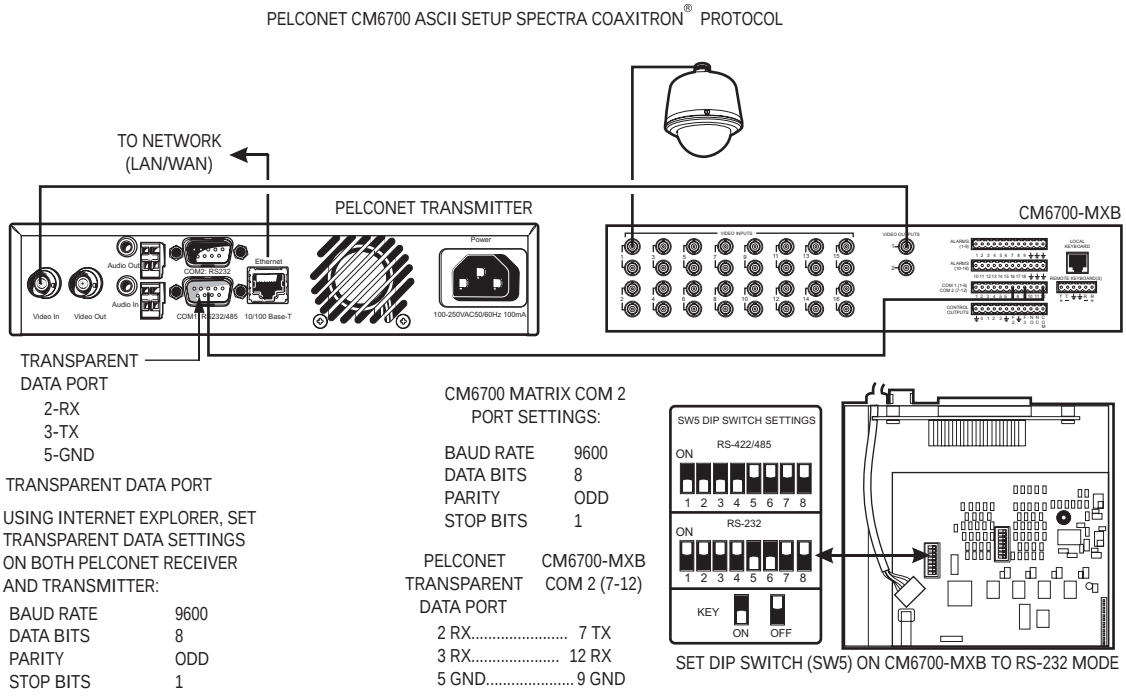


Figure 52. Using PelcoNet with CM6700 to Provide Remote Control

CONNECTING PELCONET TO A CM9760-DT FOR REMOTE BROWSER CONTROL

Refer to Figure 53. This configuration lets an operator view and control cameras on a PC using a web browser. (The operator's PC is not shown on the diagram.)

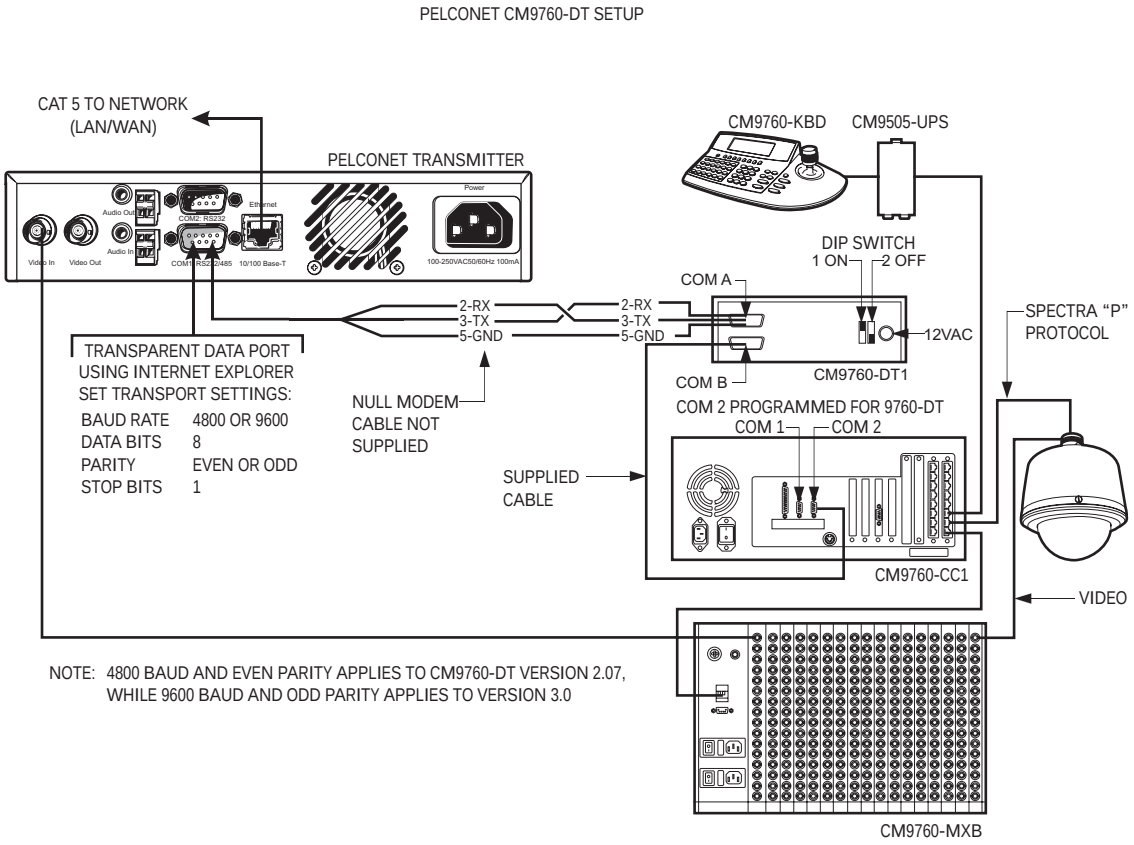


Figure 53. Using PelcoNet with CM9760-DT to Provide Remote Control of a 9760 Monitor Output

CONNECTING PELCONET TO CM9760 EQUIPMENT FOR REMOTE COMMUNICATION

Refer to Figure 44 and Figure 54 and Figure 55. These configurations let an operator remotely view and control cameras connected to the CM9760.

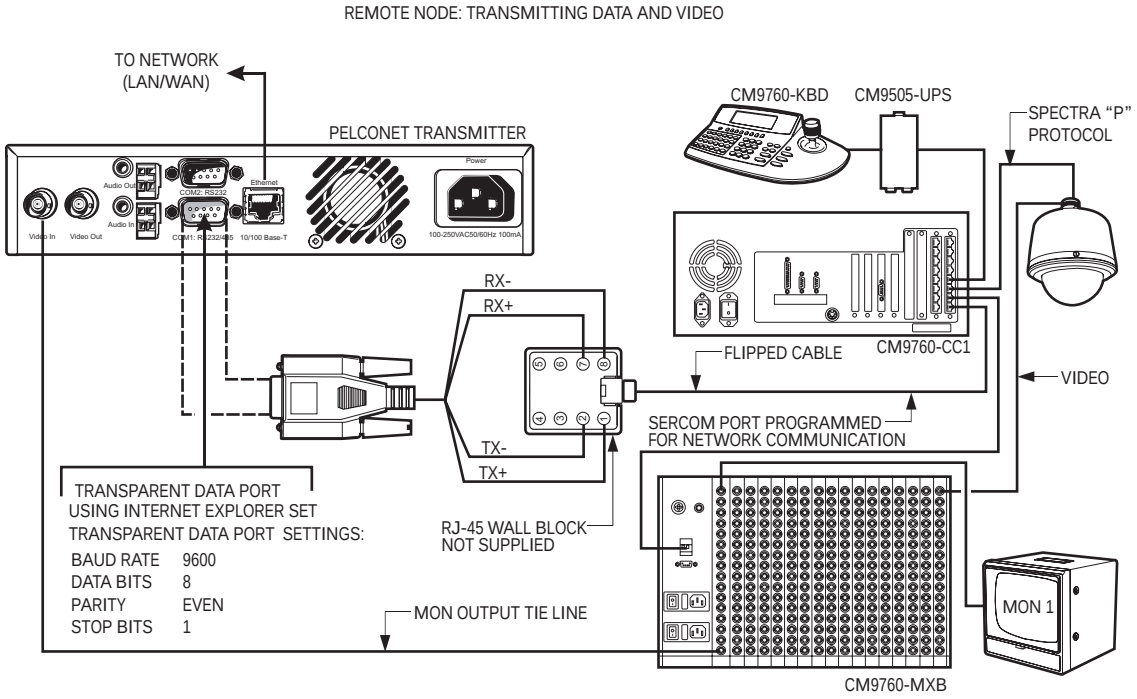


Figure 54. Using PelcoNet to Transmit Data and Video Between 9760 Nodes

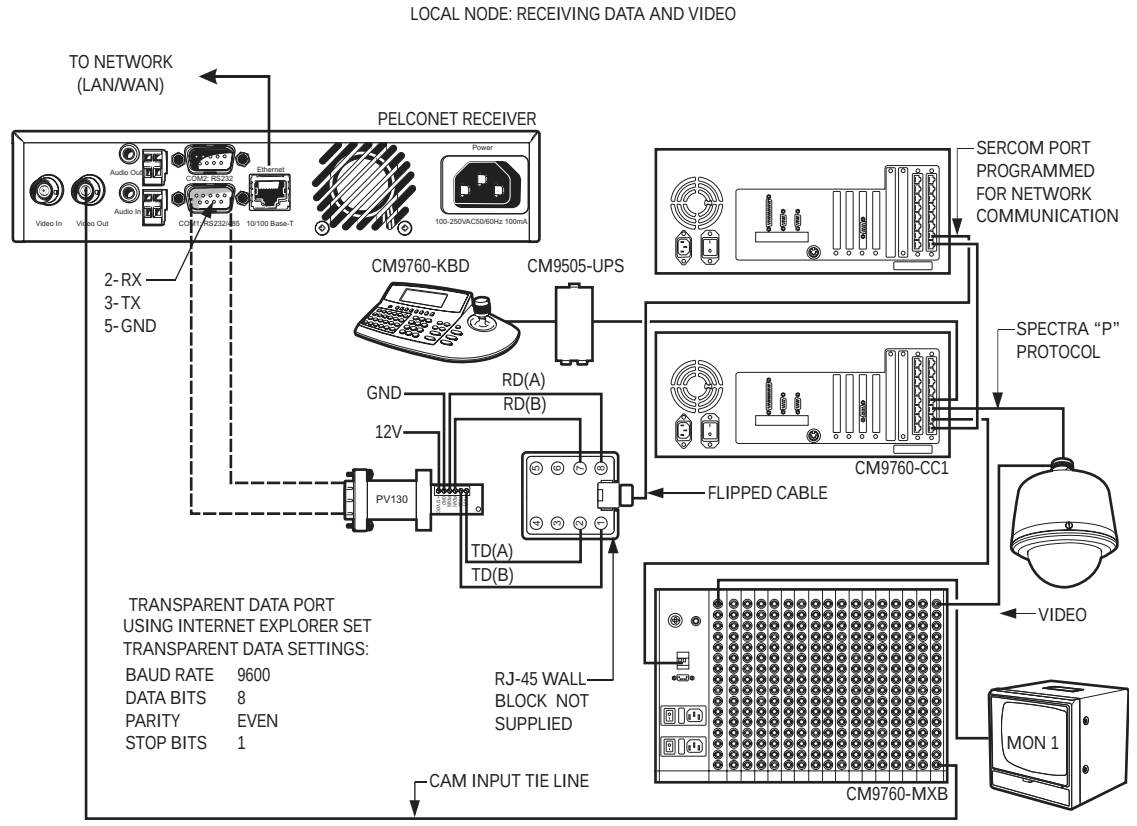


Figure 55. Using PelcoNet to Receive Data and Video Between 9760 Nodes

CONNECTING A PELCONET TRANSMITTER TO THE CM6800 ASCII PORT

Refer to Figure 56. This configuration lets an operator view and control cameras with a PC using a web browser. (The operator's PC is not shown on the diagram.) All settings are done in the CM6800 manager program or through a CM6800 menu. Note the following:

- Port 2 defaults to ASCII and RS-232.
- Ports 7 and 8 can be set to ASCII and RS-232 by using the CM6800 manager program (refer to Figure 57) or by using a CM6800 menu (refer to Figure 58).
- Pelco recommends using Port 2.

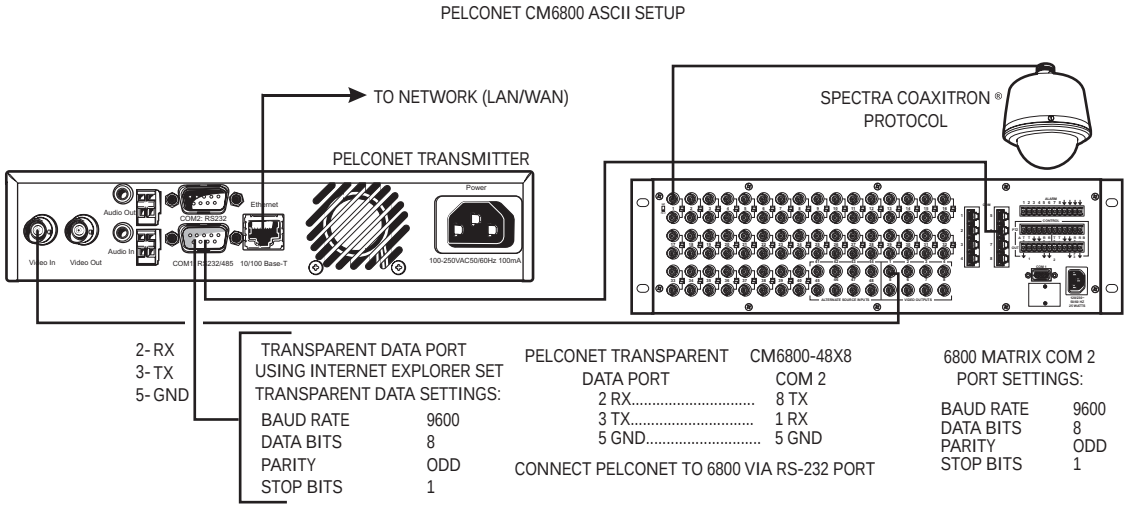


Figure 56. Using PelcoNet with CM6800 to Provide Remote Control

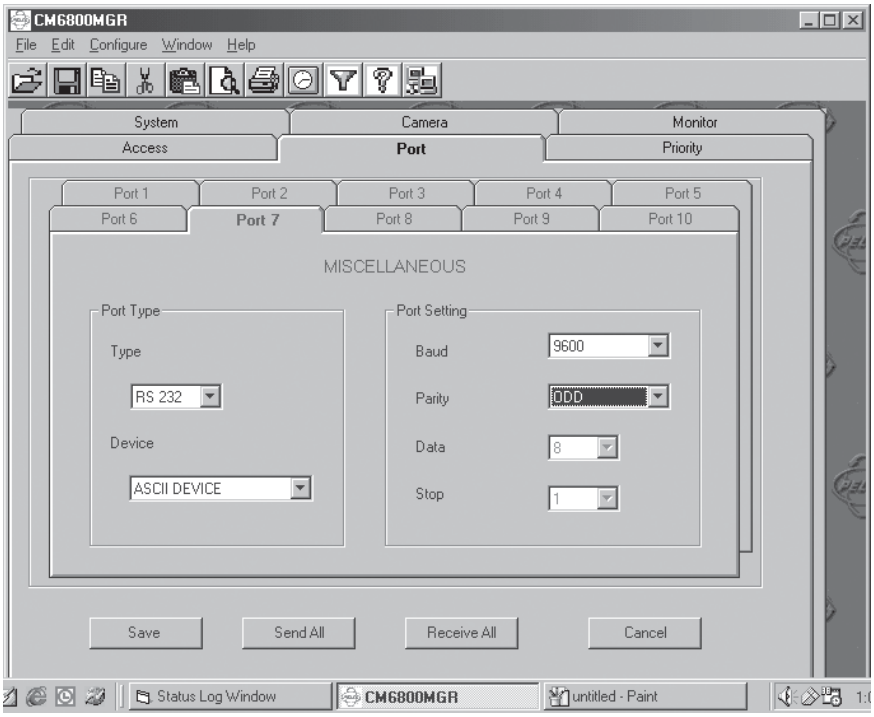


Figure 57. Manager Screen

SET SERIAL PORT 07

DEVICE:	ASCII
TYPE:	RS232
BAUD RATE:	9600
PARITY:	ODD
DATA BITS:	8
STOP BITS:	1

RETURN

Figure 58. Menu Screen

CONNECTING PELCONET TO A CM6800 AND KBD200A FOR REMOTE ASCII CONTROL

Refer to Figure 59. This configuration lets an operator view and control cameras with a remote KBD200A keyboard. All settings are done in the CM6800 manager program or through a CM6800 menu. Note the following:

- Port 2 defaults to ASCII and RS-232.
- Ports 7 and 8 can be set to ASCII and RS-232 by using the CM6800 manager program (refer to Figure 57) or by using a CM6800 menu (refer to Figure 58).
- Pelco recommends using Port 2.

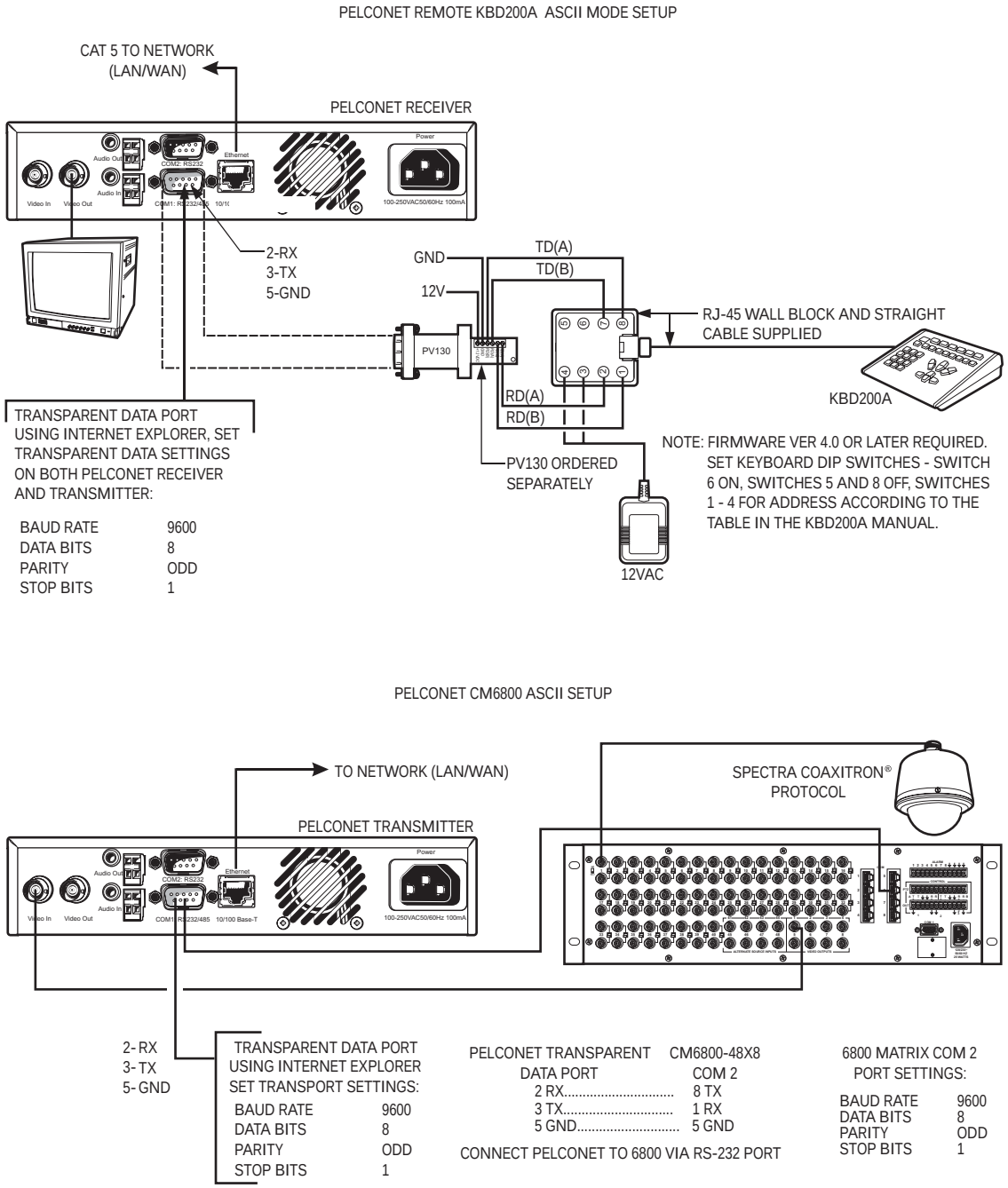


Figure 59. Using PelcoNet with CM6800 and KBD200A to Provide Remote Control

APPENDIX B – FREQUENTLY ASKED QUESTIONS (FAQS)

1. **What Pelco devices can I control from my computer with the PelcoNet NET4001 transmission system?**

   PelcoNet can control the following from Internet Explorer:
   - Spectra and Esprit
   - Genex multiplexer
   - CM9760 (requires CM9760 data translator)
   - CM9740 (requires CM9760 data translator)
   - CM9502 (through integrated ASCII port)
   - CM8500 (requires latest CM8500 data translator)
   - CM6700 (through integrated ASCII port, COM 2)
   - CM6800 matrix

2. **What TCP/IP ports does PelcoNet use?**

   PelcoNet lets you select which base port to use. You can select either 80 or 1756. This means PelcoNet will use UDP ports for some video and control data. The ports must be open for PelcoNet to function properly.

3. **Can I view PelcoNet over the Internet?**

   Yes. You will need a static IP address and enough bandwidth to view live video. Pelco recommends a minimum of 250 Kbps for medium image quality. Also check with your ISP to verify the correct TCP and UDP ports are open through any routers or firewalls through which you will connect.

4. **How many connections does PelcoNet support? Can more than one receiver connect to a transmitter at the same time?**

   Yes. PelcoNet can support an unlimited number of receivers. To do so, all hubs, switches, and routers must support multicasting (IGMP), and PelcoNet must be configured to use multicasting. If the network hardware does not support this, then the maximum number of simultaneous connections is five.

5. **Can I enlarge the picture size in the browser?**

   Yes. You can select from two different image sizes in PelcoNet with the browser: 352 x 288 or 704 x 576.

6. **What software does PelcoNet require?**

   PelcoNet works with Internet Explorer 5.5 or higher. An ActiveX plug-in is also required for Internet Explorer to get live video. All software is included.

7. **Can I control other manufacturers' equipment from the browser?**

   Not at this time.

8. **Can I record video with PelcoNet NET4001A?**

   Yes. PelcoNet can record video to the hard drive of the viewing PC (you can select the location). The video is recorded in either mp2 or mp4 format.

9. **Everything is wired correctly but I do not have any control from the browser. What else could be wrong?**

   The transparent data port settings must be set to match the equipment to which PelcoNet is connected.

   Also, in Internet Explorer, the Microsoft Virtual Machine must be enabled. To do so: on the Tools menu, select Internet Options. Then select the Advanced tab. Locate the option Microsoft VM. Place a check mark next to Java Console Enabled and JIT compiler for virtual machine enabled. Reboot your computer.

   These options are required for the Java applets in PelcoNet to function properly.

10. **Can I control the Genex multiplexer server?**

    Not at this time.

11. **Can I use DHCP (dynamically assigned IP address) with PelcoNet?**

    No.

12. **What type of compression does PelcoNet use?**

    PelcoNet uses the MPEG-2 and MPEG-4 industry standards for video teleconferencing over the Internet. They provide the most effective use of bandwidth with excellent video quality.

13. **I do not get live video in the browser but server push is working. What could be wrong?**

    Verify that the ActiveX plug-in is installed and that your video is set to 16-bit or 32-bit color. Also check with your network administrator to verify that the TCP/IP ports PelcoNet uses are not being filtered and that you have enough bandwidth.

14. **How do I program PelcoNet with Hyperterminal?**

    Using a null modem cable, connect a COM port on your PC to either COM port on NET4001A. Open Hyperterminal and set the port to use to 19200, 8, N, 1, and No Flow Control. Type **service** (lower case), and follow the help menu.

    When accessing the unit through HyperTerminal, each time after the unit boots up the program prompts for the username (enter **service**). If there has not been a reboot since you last accessed the unit, you can access it by entering **?** for the username.

15. **How much bandwidth does PelcoNet use?**

    PelcoNet's bandwidth is adjustable. You can set it from 2 to 5 Mbps. Pelco recommends a minimum of 250 Kbps for live video at medium image quality. Check with your network administrator for how much bandwidth to use.

16. **Can I use PelcoNet with a DSL or cable connection?**

    Yes. You will need a static IP address from your provider. Also verify what kind of bandwidth you will get since it varies by location. Verify that your provider is not filtering the TCP/IP ports that PelcoNet uses.

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PRODUCT WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship **for a period of one year** after the date of shipment.

Exceptions to this warranty are as noted below:

- Five years on FT/FR8000 Series fiber optic products and the following fixed camera models: CC3701H-2, CC3701H-2X, CC3751H-2, CC3651H-2X, MC3651H-2, and CC3651H-2X.
- Three years on all other fixed camera models (including Camclosure® Integrated Camera Systems) and Genex® Series (multiplexers, server, and keyboard).
- Two years on all standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM8500/CM9500/CM9700 Series Matrix, DF5 and DF8 Series Fixed Dome products.
- Two years on Spectra®, Esprit®, and PS20 Scanners, including when used in continuous motion applications.
- Two years on Esprit® and WW5700 Series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders and NVR300 Series network video recorders.months on DX Series digital video recorders, NVR300 Series network video recorders, and all Endura™ Series distributed network-based video products.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number

2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number

3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico, send goods to:

Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico and are instructed to return goods to the USA, you may do one of the following:

If the goods are to be sent by a COURIER SERVICE, send the goods to:

Pelco
3500 Pelco Way
Clovis, CA 93612-5699 USA

If the goods are to be sent by a FREIGHT FORWARDER, send the goods to:

Pelco c/o Expeditors
473 Eccles Avenue
South San Francisco, CA 94080 USA
Phone: 650-737-1700
Fax: 650-737-0933

REVISION HISTORY

Manual #	Date	Comments
C2904M	4/03	Original version.
C2904M-A	7/03	Added additional safeguards and warnings. Added note that unit needs to be rebooted after changing the IP address, subnet mask, or gateway IP address. Revised specifications to reflect stereo jacks rather than RCA phone jacks for audio.
C2904M-B	2/05	Changed pages 22 and 23 to instruct the installer to use the four supplied small screws from the rack mount kit to attach the brackets to the unit(s).

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NVIDIA is a registered trademark of NVIDIA Corporation.
ATI RADEON is a trademark of ATI Technologies Inc.
Parhelia is a trademark of Matrox Technologies Inc.

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World Headquarters
3500 Pelco Way
Clovis, California 93612 USA

USA & Canada
Tel: 800/289-9100
Fax: 800/289-9150

International
Tel: 1-559/292-1981
Fax: 1-559/348-1120

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